

Eugene S. McCartney's

Studies in Classical Weather Folklore

The fifteen articles in this file, dealing with ancient ideas about weather and other topics, were serialized in a variety of journals such as *Classical Weekly*, *Transactions and Proceedings of the American Philological Association*, *American Journal of Philology*, and *Classical Journal*, during the years 1918-1934. Compiled and bookmarked by Robert Bedrosian, 2016. This material is presented solely for non-commercial educational/research purposes.

Table of Contents

[*Some Folk-Lore of Ancient Physiology and Psychology*](#), from *Classical Weekly*, Vol. 12, No. 3 (Oct. 14, 1918), pp. 18-21; Vol. 12, No. 4 (Oct. 28, 1918), pp. 26-29; and Vol. 12, No. 5 (Nov. 11, 1918), pp. 35-38, in 15 pdf pages.

[*Spontaneous Generation and Kindred Notions in Antiquity*](#) from *Transactions and Proceedings of the American Philological Association*, Vol. 51 (1920), pp. 101-115, in 16 pdf pages.

[*An Animal Weather Bureau*](#), from *Classical Weekly*, Vol. 14, No. 12 (Jan. 17, 1921), pp. 89-93, and Vol. 14, No. 13 (Jan. 24, 1921), pp. 97-100, in 11 pdf pages.

[*Sex Determination and Sex Control in Antiquity*](#) from *American Journal of Philology*, Vol. 43, No. 1 (1922), pp. 62-70, in 10 pdf pages.

[*The Folk Calendar of Times and Seasons*](#) from *Classical Weekly*, Vol. 16, No. 1 (Oct. 2, 1922), pp. 3-7, in 6 pdf pages.

[*The "Wooden Horse" and Folk-Lore of Touching*](#), from *Classical Journal*, Vol. 21, No. 2 (Nov., 1925), pp. 112-131, in 21 pdf pages.

[*Magic and the Weather in Classical Antiquity*](#), from *Classical Weekly*, Vol. 18, No. 20 (Mar. 30, 1925), pp. 154-157, in 5 pdf pages.

The Classical Astral Weather Chart for Rustics and for Seamen, from *Classical Weekly*, Vol. 20, No. 6 (Nov. 15, 1926), pp. 43-49, and Vol. 20, No. 7 (Nov. 29, 1926), pp. 51-54, in 13 pdf pages.

Popular Methods of Measuring, from *Classical Journal*, Vol. 22, No. 5 (Feb., 1927), pp. 325-344, in 21 pdf pages.

Greek and Roman Weather Lore of the Sun and the Moon, from *Classical Weekly*, Vol. 22, No. 4 (Oct. 22, 1928), pp. 25-31, and Vol. 22, No. 5 (Oct. 29, 1928), pp. 33-37, in 20 pdf pages.

Clouds, Rainbows, Weather Galls, Comets, and Earthquakes as Weather Prophets in Greek and Latin Writers, from *Classical Weekly*, Vol. 23, No. 1 (Oct. 7, 1929), pp. 2-8, and Vol. 23, No. 2 (Oct. 14, 1929), pp. 11-15, in 20 pdf pages.

Greek and Roman Weather Lore of Winds, from *Classical Weekly*, Vol. 24, No. 2 (Oct. 13, 1930), pp. 11-16; Vol. 24, No. 3 (Oct. 20, 1930), pp. 18-24; and Vol. 24, No. 4 (Oct. 27, 1930), pp. 25-29, in 35 pdf pages.

Classical Weather Lore of Thunder and Lightning, from *Classical Weekly*, Vol. 25, No. 23 (Apr. 25, 1932), pp. 183-192; Vol. 25, No. 24 (May 2, 1932), pp. 200-208; and Vol. 25, No. 25 (May 9, 1932), pp. 212-216, in 27 pdf pages.

Greek and Roman Weather Lore of the Sea, from *Classical Weekly*, Vol. 27, No. 1 (Oct. 2, 1933), pp. 1-6; Vol. 27, No. 2 (Oct. 9, 1933), pp. 9-13; Vol. 27, No. 3 (Oct. 16, 1933), pp. 17-22; and Vol. 27, No. 4 (Oct. 23, 1933), pp. 25-29, in 26 pdf pages.

Greek and Roman Weather Lore of Two Destructive Agents Hail and Drought, from *Classical Weekly*, Vol. 28, No. 1 (Oct. 1, 1934), pp. 1-7; Vol. 28, No. 2 (Oct. 8, 1934), pp. 9-12; Vol. 28, No. 3 (Oct. 15, 1934), pp. 17-23; and Vol. 28, No. 4 (Oct. 22, 1934), pp. 25-31, in 29 pdf pages.



Some Folk-Lore of Ancient Physiology and Psychology

Author(s): Eugene S. McCartney

Source: *The Classical Weekly*, Vol. 12, No. 3 (Oct. 14, 1918), pp. 18-21

Published by: [Classical Association of the Atlantic States](#)

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420). An editorial, two columns long, labelled Radical and Dangerous, appeared in The New York Times of Sunday, January 21, 1917. In this Dr. Eliot and Dr. Flexner were both sharply criticized, and it was insisted that the General Education Board had no authority in the powers conveyed to it by the act of incorporation to spend money and use its influence for the 'modernization' of education or to control or to have anything to say about the curriculum of any college or the course of study in any school.

The next day in The Times appeared a letter signed Roy Mason, from which I take the following quotation:

The technical magazines are filled with laments that the technical man is totally unable to make himself understood except to another man with technical training.

At one time I was employed as advertising manager of a large electrical manufacturing concern. I was supposed to put into "popular" language, the meaning, use, and capabilities of the machines which it manufactured. I encountered constantly the objection: "What you have written means something entirely different to the technical man". They apparently classed themselves as a race apart with a different language from the public which they were trying to reach and to which they were endeavoring to sell their machines.

When I asked them pointed questions, "What can this machine do?" "How does it do it?" "Why does it do it?", they immediately seized a pad and pencil and began to draw diagrams. When I explained that I did not want it diagrammatically, but in words, they gave up in despair.

This reminds me of the statement of Mr. T. A. Rickard, an engineer, editor of a technical journal, to the effect that the men who have had only a technical training cannot write (see THE CLASSICAL WEEKLY 8.89). See, too, Dr. Rouse's remarks in THE CLASSICAL WEEKLY 5.26, and the reference to similar expressions by Mr. Paul Elmer More, formerly editor of The Nation, in THE CLASSICAL WEEKLY 9.97.

In The New York Times Magazine, for February 4, 1917, Dr. Thomas S. Baker, Headmaster of The Tome School, Port Deposit, Maryland, expressed the opinion that Dr. Flexner's School

will probably be an easier School and will have certain popular qualities, but, unless it departs widely from the outline which is shown in his monograph, it will bring little of permanent value to American education.

There is room here to mention only one other point made by Dr. Baker:

It would have been an experiment of great value if the Rockefeller board had undertaken to father a school with the conventional program of studies but with teachers of exceptional experience and ability. It has been announced that in the new school only 200 pupils will be at first accepted. It is probable that the authorities will have the opportunity of selecting these 200 from a large number, so that the school will be composed of picked students.

If the same care were exercised in choosing boys and teachers for the institution I should like to see founded, one that would be conducted along traditional lines, I believe results would show that conditions in the schools are not so bad as they would seem to the advocates of the "Modern School".

Others have since voiced this idea, that an 'experiment' with picked boys and picked teachers will prove one thing only—what can be done under abnormally favorable conditions. Certainly Dr. Baker and others are right in insisting that, if the Rockefeller Foundation is really guided by a scientific spirit and by a genuine desire to advance the cause of education, it will experiment—truly experiment—under equally favorable conditions with the 'traditional' School, under the conduct of true friends of that sort of School. A true experiment must consider all sides, all phases of a question. But the Rockefeller Foundation has thus far given no hint that it means to make a just experiment of this sort, in which the two types of Schools shall be treated in exactly the same way.

C. K.

(To be continued)

SOME FOLK-LORE OF ANCIENT PHYSIOLOGY AND PSYCHOLOGY

The rapid progress that is now being made in solving the mysteries of the human body is in marked contrast to the slowness with which medical science developed in antiquity. As late as the first century B. C., we find an eminent Roman writing as follows: 'We do not know our own bodies: of the position of the organs and the function each exercises we are ignorant' (Cicero, *Academica Priora* 2.122).

The superficial manner in which medical data were gathered may be illustrated by a quotation from Pliny, N. H. 11.149:

'The most learned authors say that there are veins which communicate from the eyes to the brain, but I am inclined to think that the communication is with the stomach; for it is quite certain that a person never loses an eye without being affected at the stomach'.

The lack of an accurate science of anatomy and physiology among the ancients gave rise to distorted conceptions about the seats of the emotions and of various physical attributes, as well as of the moral and intellectual faculties. These beliefs were in reality primitive science, but in retrospect they may be called the folk-lore of physiology and psychology. The mistakes have long since been recognized and rectified, but they have left an indelible impress upon language and methods of expression, and, in numerous instances, upon customs. It is the purpose of the present paper to collect typical passages in Latin literature referring to the seats of our physical and psychological experiences. Many of these ideas came to the Romans directly or indirectly from peoples living farther to the East, so that Roman views reflected those of several great civilizations bordering on the Eastern shores of the Mediterranean.

The scientific study of internal anatomy really began in Babylonia with a desire to know more of the liver for purposes of divination, and hence is more or less a by-product of hepatoscopy. As knowledge widened, fossilized expressions from previous strata of thought

remained to tell the story of the groping evolution of the science. Whatever advances were made received much more tardy recognition in antiquity than they do to-day. At times we find two strata of ideas existing side by side, especially when older beliefs are fostered by the poets, as happens in the case of the liver¹.

To-day we speak of being faint-hearted, lion-hearted, kind-hearted, stony-hearted, broken-hearted, heartless, disheartened, of learning by heart, of purity of heart, of loving with all one's heart, etc., yet the primacy now accorded to the heart was once held by the liver.

So much blood centers in the liver that it came to be regarded as the seat of life². This explains why in the older stratum of belief the liver rather than the heart is regarded as the vital organ. Ovid, *Heroides* 6.91-92, refers to a form of sympathetic magic by which the death of enemies is encompassed by driving needles into the liver of wax images:

Devovet absentes, simulacraque cerea fingit
et miserum tenues in iecur urget acus.

So Ulysses (*Od.* 9.301) strikes Polyphemus, not to the heart, but to the liver. Likewise Jeremiah, in *Lam.* 2.11, lamenting the misery of Jerusalem, exclaims, My liver is poured out upon the earth for the destruction of the daughter of my people.

The stories of Tityus and Prometheus originated very early, so that it is always the liver that is associated with their sufferings. A good illustration may be found in *Aeneid* 6.595-600.

Professor Jastrow writes as follows:

Theocritus, in describing the lover fatally wounded by the arrows of love, speaks of his being 'hit in the liver', where we should say that he was 'struck to the heart', and if, in the myth of Prometheus, the benefactor of mankind is punished by having his liver perpetually renewed and eaten by a vulture, it shows that the myth originated in the early period when the liver was still commonly regarded as the seat of life. The renewal of the liver is the renewal of life, and the tragic character of the punishment consists in enduring the tortures of death continually, and yet being condemned to live for ever³.

To the feeling that the liver was the seat of life may be ascribed the belief that the *iecora* of certain animals possessed remedial powers⁴. It may likewise be noted that the liver of the long-lived deer was one of the ingredients that Medea used to restore youth to her aged father-in-law (*Ovid, Met.* 7. 273).

Cicero, *N. D.* 1.99, states that the liver, the heart,

and the lungs, are the seats of life⁵. The early intimate association of the liver with life is shown by German *Leib* and *Leber*, which are historically the same word. Perhaps the English words *life* and *liver* go back ultimately to the same root.

The liver has, likewise, been regarded as the center of intellectual and emotional life. To it, along with the heart, is assigned the seat of understanding: *En cor Zenodoti, en iecur Cratetis* (*Bibaculus*, apud Suetonium *Gram.* 11). In other passages it is the seat of the affections, *Non ancilla tuum iecur ulceret ulla puerve* (*Horace, Epp.* 1.18.72)⁶; of anger, *quanta siccum iecur ardeat ira* (*Juvenal* 1.45)⁷; of harshness and compassion, *Iecur fors horridum flectam merendo* (*Seneca, Herc. Oet.* 574); of grief, *Comprime infirmum iecur* (*Seneca, Herc. Oet.* 1677); of fear as well as of courage, *Cor attonitum salit, pavidumque trepidi palpitat venis iecur* (*Seneca, Herc. Oet.* 708-709)⁸.

While the Italian word for courage, *coraggio*, is a derivative of *cor*, the word for liver is still used to indicate great boldness; compare e. g. *Ebbe il fegato di arrestare i ladri da se*, 'He had the liver to arrest the robbers single-handed'. Likewise the Spanish *tener hígados* means 'to have courage'. There are in existence at the present time savage tribes which believe that the liver is the seat of courage, and which think that they can acquire the valor of a slain enemy who has behaved with conspicuous bravery by eating his liver ritually prepared⁹.

In English, 'white-livered', and in Greek *λευκῆπαλις*, indicate cowardice¹⁰.

The source of concupiscence is likewise to be found in the liver: *Voluptas et concupiscentia, iuxta eos qui de physicis disputant, consistit in iecore* (*Hieronymus, Epp.* 64). The same author repeats this idea elsewhere: *Porro libidinem, luxuriam, et omnium voluptatum cupidinem in iecore, id est, in vitulo qui terrae operibus haereat* (*Com. in Ezechielem* 1.1.10).

Parallels might be adduced from other languages. Because of his assault on Leto, the liver of Tityus is torn by vultures in the realm of Hades (*Od.* 11.578). So in *Proverbs* 7.23 the victim of the courtesan is lured on until the fatal arrow pierces his liver.

In short, the Romans believed that all the overmastering passions emanated from this organ: *Intus et in iecore aegro nascuntur domini* (*Persius* 5.129).

¹In *Cymbeline* 5.5.14 three heroes are addressed as the Liver, the Heart, and the Brain of Britain.

²Compare *As You Like It* 3.2.442-445, And this way will I take upon me to wash your liver as clean as a sound sheep's heart, that there shall not be one spot of love in it. Compare also *Twelfth Night* 2.4.99-100:

Alas, their love may be call'd appetite,—

No motion <i. e. emotion> of the liver, but the palate.

³My Knights, I will inflame thy noble liver,

And make thee rage.—II *King Henry IV* 4.5.28-29.

⁴Compare *T. N.* 3.2.17-20 She did show favour to the youth in your sight only to exasperate you, to awake your dormouse valour, to put fire in your heart, and brimstone in your liver.—The absence of blood from the liver indicates cowardice; compare *T. N.* 3.2.64-67 For Andrew, if he were opened, and you find so much blood in his liver as will clog the foot of a flea, I'll eat the rest of the anatomy.

⁵Frazer, *The Golden Bough*³, *Spirits of the Corn and of the Wild*, 2.48.

⁶Compare II *Henry IV* 4.3.113 The liver white and pale, which is the badge of pusillanimity and cowardice; *M. V.* 3.2.86 livers white as milk.

¹Compare *Psalms* 16.9, Therefore my heart is glad and my liver exulteth.

²The late Professor Wm. A. Lamberton, of the University of Pennsylvania, advanced the theory that the attribution of the seat of life to the liver was due to the character of ancient warfare. The peculiar structure of the human body not only gave better natural protection to the organs of the upper trunk cavity, but also made it possible to protect them more efficiently with pieces of armor. The liver was, then, in a peculiarly vulnerable position, and one would suppose that more warriors died from wounds in the liver than from injuries to the heart. At all events wounds would call attention to the peculiarly bloody character of the liver,

³Religious Belief in Babylonia and Assyria, 152.

⁴Pliny, *N. H.* 8.203; 28.197, 229.

There is no organ in which the physiological accompaniments of emotion are more pronounced than in the case of the liver. Thus, indulgence in anger leaves the system overcharged with secretions that the angry feelings have caused it to discharge. It is small wonder, then, that the ancients interchanged the relations of cause and effect, and maligned the liver for things of which it was innocent.

Although the liver was the traditional center of so many phases of human existence, the heart gradually began to usurp in popular belief¹¹ some of its functions. We are informed by Pliny, N. H. 11.186, that, at the time Pyrrhus was driven from Italy (274 B. C.), the heart was for the first time employed in divining the future.

'The addition of the heart to the liver corresponds manifestly to the time when, instead of regarding the liver as the seat of vitality, the heart was accorded this distinction; and this change reflected no doubt the progress in anatomical knowledge, through which the important functions of the heart were more clearly recognized¹²'.

The Romans realized that the heart was the most vital organ of the body, for Pliny, N. H. 11.182, notes that, when it alone is injured, death ensues forthwith, but that, when other organs are destroyed, vitality remains in the heart. He states in addition that the heart is the seat of life and of the blood. Hence the word *cor* is synonymous with *vita* in Ovid, *Fasti* 6.161-162:

Cor pro corde precor, pro fibris sumite fibras,
hanc animam vobis pro meliore damus.

As was the case with the liver, the hearts of some animals had curative powers attributed to them; for instance, the heart of the hyaena, when taken with food or drink, was said to alleviate all kinds of pain in the body¹³.

Cicero, *Tusc.* 1.18, declares that in the estimation of some men the heart itself seems to be the soul, and hence wise Nascia was named *Corculum* and shrewd Aelius Sextus was called *egregie cordatus homo*.

The expression, *Cor iubet hoc Enni* (Persius 6.10), shows that the heart represents the essence of existence. The identity of one's self with the heart is further shown by the fact that the word *cor* came to be used as the equivalent of a personal pronoun. In Ennius, *Ann.* 13.381-383, Vahlen, *cor* is to all intents and purposes a poetic variation of *me* in the first line:

Hannibal audaci cum pectore de me hortatur,
ne bellum faciam, quem credidit esse meum cor
suasorem summum et studiosum robore belli.

Gellius, *Noctes Atticae* 6.2.10, explains that *cor meum credidit* is here equivalent to *ego credidi*.

The custom of some savage tribes of eating the hearts of victims, under the impression that they can thereby acquire the virtues of the dead, particularly their courage, is an interesting proof of the part that this organ

was supposed to play in life¹⁴. Not less instructive is the custom practised occasionally until recent times of burying the heart by itself¹⁵.

Following in the wake of the Greeks, the Romans made the heart the seat of intellectual activities. Pliny, N. H. 11.182, assures us that the mind dwells there: *ibi mens habitat*. Ennius's statement (*Aulus Gellius*, 17.17), that he had three hearts because he spoke Greek, Oscan and Latin¹⁶, is another indication that the heart was regarded as the seat of the intellect.

According to Roman ideas, the entire physical, mental, and emotional life centered in the heart. It was the seat of life and of the soul, of the affections, of cares, of terror and cowardice, of grief and sadness, of wrath and frenzy, of compassion, of love, of the intellectual faculties, of wisdom, intelligence, memory, etc. Numerous illustrations of such usage may be found in the *Thesaurus Linguae Latinae*, s. v. *cor*. We may convey some idea of the many notions that the Romans connected with the heart by merely citing Latin words derived from *cor*: *concordes*, *excordes*, *vecordes*, *cordatus*, *est cordi*, *haberi cordi*, *recordor*, *credo*, *misericordia*, *Corculum*, etc.¹⁷

In a word, the heart exercised dominion over life: *dominium vitae continens cor* (Caelius Aurelius, *Chron.* 2.30.162)¹⁸.

Beliefs with regard to the heart have had some effect upon customs. Macrobius, *Saturn.* 1.6.17, tells us that it was the opinion of some men that boys were made to wear a figure of a heart on the bulla so that they might regard themselves as already men, *si corde praestarent*.

There is another custom, which owes its inception to Egypt. Both Greeks and Romans wore rings on the left hand upon the finger next to the smallest; in fact they called that finger the ring-finger. Apion (see *Aulus Gellius* 10.10), who was learned in the wisdom of the Egyptians, informs us that, when they opened bodies, they found a very delicate nerve which ran from this finger to the heart, and that therefore it seemed not unfitting to do honor to this finger¹⁹. It remained, however, for Alexander ab Alexandro (4.26) to mention this finger in connection with a betrothal ring. He differs from Apion in saying that it was a very delicate vein which connected the finger with the heart. It may be noted that the Germans call the ring-finger the *Herz-finger*.

As the functions of the heart were not entirely realized until Harvey's discovery of the circulation of the blood, it is not strange that there were so many misconceptions in antiquity. Galen, a Greek physician of the second century A.D., who spent considerable time at Rome, made a great step forward on the basis of convincing data. He noted that gladiators who received mortal

¹¹Frazer, 147-153.

¹²F. Andry, *Recherches sur le Coeur et le Foie*, 100-123.

¹³Compare 'Another language is another soul'.

¹⁴Among the English derivatives of *cor* are courage, encourage, discourage, credit, cordial, concord, discord, record (compare, to take to heart), accord.

¹⁵Compare Aristotle, *De Partibus Animalium* 3.4.

¹⁶Compare Macrobius, *Saturn.* 7.13.7-8; Pliny, N. H. 33.24. See Andry, *Recherches sur le Coeur et le Foie*, 35-36.

¹¹In Twelfth Night 1.1.37-38 the heart and liver along with the brain are called 'sovereign thrones'.

¹²Tastrow, *Religious Belief in Babylonia and Assyria*, 159, 161.

¹³Pliny, N. H. 28.102, 111.

wounds in the heart retained possession of their mental faculties as long as they lived.

He concluded, therefore, that the seat of the intellect was not in the heart²⁰.

We learn from Cicero, Tusc. 1.19, that some thinkers regarded the brain as the seat and place of the soul: alii in cerebro dixerunt animi esse sedem et locum. An interesting attempt to reconcile conflicting theories among the Greeks was made by Plato, who postulated a triple soul, assigning reason (*ratio*) to the head as the highest part of the body, wrath (*ira*) to the breast, and cupidity (*cupiditas*) to the region below the midriff (Cicero, Tusc. 1.20). According to Cicero, Tusc. 1.19, there was still another place for the soul, as Empedocles regarded it as a suffusion of blood from the heart: Empedocles animum esse censet cordi suffusum sanguinem.

Tangible parts of the body, as the liver, the heart, and the brain, did not, however, provide the most satisfactory abode for the soul. Something volatile was found to be more suitable. The most apparent manifestation of death was the cessation of breathing; hence the breath came naturally to be regarded as the seat of the soul: Sunt enim qui discessum animi a corpore putent esse mortem; sunt qui nullum censeant fieri discessum, sed una animum et corpus occidere, animumque in corpore extingui (Cicero, Tusc. 1.18)²¹.

The soul left the body by the same route as did the breath, and to say that the soul was in the nose meant that it was at its last station in its exit from the body, and that death was near. An interesting sentence occurs in Petronius 62: Mihi anima in naso esse, stabam tamquam mortuus²².

The close association of breath with life is illustrated by an account of the creation of man which is contained in the Etymologicum Magnum, s. v. 'Ἰκβύλιον: 'Zeus bade Prometheus and Athena mould images out of clay, and ordered the winds to breathe into them and to quicken them'. At death the life returned to the winds: in ventos vita recessit (Aen. 4.705).

The Biblical account of creation is very similar to that of the Greeks: And the Lord formed man of the dust of the ground, and breathed into his nostrils the breath of life; and man became a living soul (Gen. 2.7).

It is a striking coincidence that in most languages one word denotes both breath and soul. Thus, the Hebrew *nephesh*, 'breath', passes into the meanings 'life', 'soul', 'mind', 'animal'. Compare the Greek *psyche* and *pneuma*²³. The belief that the breath was the seat of

the soul is reflected in Latin also. Thus we find Cicero, Tusc. 1.19, saying: Animum autem alii <dixerunt> animam, ut fere nostri (declarant nomina, nam et *agere animam* et *efflare* dicimus, et *animosos* et *bene animatos*, et *ex animi sententia*; ipse autem animus ab anima dictus est). Cicero might have added to his list *unanimitas*, *bono animo*, etc. The word *spiritus* also is used for soul, and *Spiritus Sanctus* for Holy Ghost.

The attribution of the soul to the breath gave rise to the custom of catching the breath of the dying: Matres . . . nihil aliud orabant nisi ut filiorum postremum spiritum ore excipere liceret (Cicero, Verr. 2.5. 45)²⁴. Similar customs elsewhere might be cited²⁵: e. g.

Among the Seminoles of Florida, when a woman died in childbirth, the infant was held over her face to receive her parting spirit, and thus acquire strength and knowledge for its future use²⁶.

(To be continued)

THE UNIVERSITY
OF TEXAS.

EUGENE S. MCCARTNEY.

REVIEW

The Equestrian Officials of Trajan and Hadrian: Their Careers, with Some Notes on Hadrian's Reforms. By Raymond Henry Lacey. Princeton University Dissertation. Princeton University Press (1917). Pp. vii + 87. 75 cents, net.

This is a precise and elaborately documented study, well planned and methodically executed. It belongs to the type of studies in which earlier generalizations are reviewed and revised in the light of materials not available to the scholars who first made the generalizations. On the whole, one's confidence in the acumen and judgment displayed by the great historians and philologists in the past half century is strengthened, for, although some corrections are inevitable, the number is surprisingly small in view of the very considerable accessions of new material. This material is conveniently arranged in a chronological list of Equites for the period, with a full citation of the pertinent data about each. Of the 98 listed, 23 came to be known since the appearance of the Prosopographia Imperii Romani, and in the case of 22 others new evidence was available. Two excellent indices, the first by names, the second by offices, make every significant fact easily accessible, and contribute greatly to the usefulness of this repository of critically sifted material.

Since experience has shown that scarcely any one who enjoys a widely recognized reputation for having been the first to do something actually was the first to do that thing, we are not surprised at the author's conclusion that "several changes commonly attributed to Hadrian were in fact made by Trajan", to which must, of course, be added, by way of justifying the *communis*

²⁰Galen, De Locis Effectis (Volume 8, page 304, in Kuehn's edition).

²¹Compare *aurae vitales*, 'life-giving air'; *exanimis*, 'breathless', 'lifeless'. Vergil, Aen. 2.561-562, represents King Priam as 'breathing out his life'. Uncle Remus's definition of a dead man is 'one wid 'is bref gone'. Compare also Psalm 104.29. Thou takest away their breath, they die and return to their dust.

Some examples in English are instructive:
God witness with me, when I here came in,
And found no course of breath within your majesty,
How cold it struck my heart!—II King Henry IV 4.5.150-152.
Lend me a looking-glass;
If that her breath will mist or stain the stone,
Why, then she lives.—King Lear 5.3.260-262.

²²See Crusius, Rheinisches Museum, 46.319.

²³See Tylor, Primitive Culture 1.432-433.

²⁴Compare Vergil, Aen. 4.684-685; Seneca, Herc. Oet. 1341-1343; Ovid, Met. 12.424-425; Ovid, Ars Am. 3.745-746.

²⁵Tylor, Primitive Culture 1.433. See also Frazer, The Dying God, 194-196.

²⁶When this idea occurs in English verse, it is, of course, only a poetic fiction. See Pope, Eloisa to Abelard, 324, Suck my last breath, and catch my dying soul.



Some Folk-Lore of Ancient Physiology and Psychology (Continued)

Author(s): Eugene S. McCartney

Source: *The Classical Weekly*, Vol. 12, No. 4 (Oct. 28, 1918), pp. 26-29

Published by: [Classical Association of the Atlantic States](#)

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classic. Further, he adds: "Of the part to be played by art and music I am not qualified to speak".

An interesting paper by a non-classicist is that by Mr. Isaac Thomas, Head of the Department of Mathematics in the Hopkins Grammar School, New Haven. It is entitled Dr. Flexner's "A Modern School", and appeared in *School and Society* 6.605-608, November 24, 1917 (it was this paper that stirred Mr. Blumberg to speech: see *THE CLASSICAL WEEKLY* 12.17). Mr. Thomas says that even a cursory reading of Dr. Flexner's paper shows the author's obsession, "his demon of torment being 'traditional' education in general and the classics in particular". Mr. Thomas points out, as others have, glaring inconsistencies in Dr. Flexner's paper, and emphasizes Dr. Flexner's inability to reason. He then maintains that the Modern School is unscientific, in that, so far as Latin, Greek, and Mathematics are concerned, Dr. Flexner will allow no tests: he has prejudged the case and closed his mind against them. As a result of this unscientific attitude, the Modern School is to allow its pupils no freedom of choice with respect to their studies, and its studies will lead nowhere (607):

As it shuts its pupils off from unhindered choice at the beginning of their course, so in the path provided for them, the way has not only been hedged within very narrow limits, but has neither clear direction nor free exit. To me it resembles nothing so much as the nets we used to see in the Sound, set for menhaden, cunningly arranged for wind and tide but leading to the "pocket" from which there was no escape. Apparently "A Modern School" has given no thought, no care, to the question whether its pupils might not sometime find themselves caught in the net of inadequate preparation for future advance, if not in a cul de sac of unavailing and hopeless struggle.

Mr. Thomas maintains further that in the Modern School the spirit of manliness and bravery is conspicuously absent. A school should train (607) in the three preeminently manly qualities, endurance, courage, and patience. Many times and always in vain, I have read through A Modern School for some word or hint that it regards such training as part of its business. Work upon any subject as a means of gaining patience and courage for further work upon it, seems to have been wholly left out of the scheme, and training a pupil to self-dependence, to have been entirely forgotten. No future, needing any or all the three qualities I have mentioned, has been planned for in this school, but the needs or fancied needs of the pupil and what he might be *interested* in are to be the chief arbiters in determining what he is to do and *how*. So far as possible work—except as the pupil likes it—is to be eliminated.

Finally, Mr. Thomas points out that from first to last in the Modern School the appeal is to the selfish interest of the pupil. "Himself is to be the center of all his thought; his material advancement, the object of all his care" (608).

In *The Classical Journal* 13.193-199, December, 1917, Mr. Clyde Murley, of the Southern Methodist University, Dallas, Texas, attacked Dr. Flexner in a paper entitled *Content Studies and Content Teaching*.

(*To be concluded*)

C. K.

SOME FOLK-LORE OF ANCIENT PHYSIOLOGY AND PSYCHOLOGY

(Continued from page 21)

With increasing knowledge of anatomy it was recognized that the heart and the liver did not possess all the functions and attributes ascribed to them. Thereafter the general tendency was to place the baser qualities below the diaphragm, in the abdominal cavity, to put the next higher in the thoracic cavity, and to assign to the head the highest elements of man's nature, the intellectual. One will recall in this connection Plato's three-fold division (see above, page 21).

We shall now pass to a consideration of the notions attaching to the abdominal cavity. The writer would not, however, imply that all the ideas hereafter mentioned originated after this step forward in anatomy.

As one's mental condition is directly influenced by his digestion, it is not strange that the word *stomachus* came to indicate good humor and contentment as well as irritation, vexation, and anger, and that *stomachosus* meant 'wrathful', and *stomachari* 'to be angry'.

Martial (12 Praef.) rails at certain persons *adversus quos difficile cottidie habere bonum stomachum*. Cicero, *Ad Att.* 6.3.7, speaks of arousing laughter instead of stomach, i. e. ire; *risum magis quam stomachum movere*. The word *stomachus* can be used as a synonym of *iracundia*; compare *homo . . . exarsit iracundia ac stomacho* (Cicero, *Verr.* 2.2.20).

While it is true that our mental state is affected by our digestion, it is just as true that anger impairs digestion, and causes the muscles of the stomach to go on strike, often bringing on an attack of indigestion. Possibly the ancients occasionally interchanged this relation of cause and effect, and accused the stomach of conditions for which it was not responsible.

This organ must have been regarded as one of the seats of merriment, since Cicero, *Ad Fam.* 2.16.7, has the phrase, in *stomacho ridere*. Apuleius, *Met.* 3.10, mentions an instance of people laughing till their stomachs ached: *Hi gaudii nimietate gratulari, illi dolorem ventris manuum compressionem sedare*²⁸.

The stomach was capably aided by the bile in upsetting mental equanimity. According to Pliny, *N. H.* 11.192, the bile est . . . nihil aliud quam purgamentum possum sanguinis et ideo amarum est²⁹. He states also that some few men who are without bile have robust health and live longer³⁰. It is not to be wondered at that the bile came to be regarded as the seat of ill-nature and melancholia and the cause of moodiness.

'In the black bile lies the cause of madness in man, and of death if it is entirely expelled. Hence the word

²⁸Compare The queen uttered some choler and stomach against them, Throckmorton in Tytler, *History of Scotland* (1854), 3.134.

²⁹Compare Pero puedo jurar que jamás me vió después de una ausencia más ó menos larga sin que su abdomen dejase de experimentar violentas sacudidas de risa. . . (Valdés, *La Alegría del Capitán Ribot*, initio).

³⁰The Latin *faex*, 'dregs', supplies the root for a number of words for liver: Italian *fegato*, Venetian *figo*, Spanish *higado*, Portuguese *fígado*.

³⁰According to modern notions, the man who is without bile, metaphorically speaking, is a coward. Compare *Er hat keine Bile; Il ne se fait pas de bile*.

bile as applied to the character is a reproach. So great is the poison in the gall when it spreads to the mind. In addition when it wanders over the entire body it takes the color from the eyes too. When it is ejected on bronze vessels, they become black on contact with it, so that no one ought to wonder that bile is the poison of serpents³¹.

The Latin *atra bilis* is, of course, a translation of the Greek *μελαγχολία*. Black bile is an entirely imaginary fluid. It was supposed to be thick, black and acrid, and was believed to be secreted by the renal or atrabiliary glands, or by the spleen.

An organ of a character far different from that of the stomach and the bile is the spleen. With a rather dubious air Pliny, N. H. 11.205, informs us that there are persons who believe that with the removal of the spleen man loses the power of laughter, and that unrestrained laughter is due to an enlarged spleen. Persius, 1.12, provides further evidence that this organ was regarded as the seat of laughter: *sed sum petulanti splene cachinno*. With this compare Shakespeare, L. L. L. 3.1.66 *Thy silly thought enforces my spleen*³².

At times the organs of the abdominal cavity are referred to collectively as *exta*, *viscera*, or even *ilia*. Occasionally qualities are ascribed to them generically when the writer has some special organ in mind. I shall cite but one instance (Vergil, Ecl. 7.25-26):

Pastores, hederæ crescentem ornate poetam,
Arcades, invidia rumpantur ut ilia Codro³³.

When classical writers used the words *exta* and *viscera* in connection with divination, they were thinking primarily of the liver or of the heart. Many of the ideas connected with these two organs were very probably ascribed in earlier times to the intestines. This is indicated by the etymology of the word *haruspex*, which Walde explains as 'Darmschauer', 'bowel-searcher'.

A seat of mirth may have been located in this part of the body; Apuleius, Met. 10.16, speaks of a person's laughing 'until his intestines hurt'.

The grammarian Didymus, who is said to have written as many as 3,500 books, was dubbed *χαλκέντερος*, which has been well translated 'Copper-guts', because of his capacity for work. The nickname seems to indicate that powers of endurance and vigor were associated with the entrails³⁴. Compare "thou thing of no bowels, thu!" (Troilus and Cressida 2.1)³⁵.

³¹Pliny, N. H. 11.193. Compare Plautus, Capt. 595-596. *Viden tu illi maculari corpus totum maculis luridis? Atra bilis agitat hominem.*

³²Compare also, T. N. 3.2.70-71 *If you desire the spleen, and will laugh yourselves into stitches, follow me.*

³³Compare Tausend Gefühle bestürmen mein Inneres, Zorn, Liebe, Freude, Schmerz (Hugo Miller, Im Wartesaal erster Klasse, 631-632).

³⁴This suggests the vulgar English, 'He has the guts'.

³⁵Among other peoples there are many notions connected with the intestines. In Spanish, *hacer de tripas corazón*, 'to make heart from intestines', means 'to hide one's dissatisfaction or disappointment', 'to pluck up heart'. Compare Schiller, Wilhelm Tell 365-367.

Habt Ihr denn gar kein Eingeweid; dass Ihr Den Greis, der kaum selber schleppen kann, Zum harten Frondienst treibt?

A typical Biblical instance occurs in Gen. 43.30, 'And Joseph made haste; for his bowels did yearn unto his brother.'

Figurative uses are still current: he had every claim upon the

The use of the word *renes* as a seat of the emotions and affections was well established in ecclesiastical Latin: *exultabant renes mei* (Proverbs 23.16); *renes meos et cor meum* (Psalms 26.2); *quia ego sum scrutans renes et corda* (Revelations 2.23); *possedisti renes meos* (Psalms 139.13).

Even the diaphragm separating the upper and the lower cavity of the trunk has special powers popularly ascribed to it. The Greek word for mind, *φρήν*, or, more generally, *φρένες* (compare *phrenology*), means, in an anatomical sense, 'midriff'³⁶. The Romans translated this word by *praecordia*, and in poetry at least transferred some of the Greek ideas connected with it. Hence Ovid, Met. 11.149, uses *praecordia mentis* for 'mind', and Propertius 2.4.21 employs *mutare praecordia* in the same way. Occasionally *praecordia* indicates the seat of the feelings and passions; compare e. g. Aen. 2.367 *Quondam etiam victis redit in praecordia virtus*.

The Latin used a borrowed form *phreneticus* in the sense of 'mad', 'delirious', 'frantic'³⁷.

It is in the midriff that Pliny, N. H. 11.198, prefers to locate gaiety and laughter:

'In this part above all is the seat of gaiety, a fact which is best proved by tickling the armpits, to which it extends³⁸. In no other part of the body is the skin more delicate, and it is for this reason that one experiences pleasure in scratching the flesh there. Hence in battles and gladiatorial combats men with the midriff pierced die in the act of laughing'.

In the same passage Pliny says:

'Surely to this organ quick ready wit is to be attributed; and hence it is not fleshy, but composed of fine sinews and membranes'.

With this statement one can contrast *pinguis Minerva*, an expression which attributes stupidity to fatness.

Of the organs in the thoracic cavity, the heart and the lungs are the only ones to which I have found any qualities erroneously attributed. The notions connected with the heart have already been discussed. It may be noted, however, that the word *pectus* is sometimes used by synecdoche for *cor*. An excellent illustration occurs in Vergil, Aen. 1.567-568:

Non obtusa adeo gestamus pectora Poeni
nec tam aversus equos Tyria Sol iungit ab urbe³⁹.

The lungs are naturally regarded as a seat of pride. Persius 3.27-29 exclaims:

Hoc satis? An deocat pulmonem rumpere ventis⁴⁰
stemmate quod Tusco ramo millesime ducis,
censoremve tuum vel quod trabeate salutas?

bowels of your compassion, Stevenson, The Merry Men; and how Sir Thomas and Mr. John had Christian bowels, and did not push him to extremities, Carlyle, Essay on Burns, 2; Thackeray, after revealing to Mr. Brookfield his love for Mrs. Brookfield, exclaimed: 'Well, I have opened my bowels to you', The Outlook, February 14, 1914, page 342.

³⁶See Seymour, Life in the Homeric Age, 487-488.

³⁷Compare Spanish *frenético*, 'mad', 'frantic', 'furious', 'insane'; French *frenétique*, 'distracted', 'frantic', 'raving'.

³⁸In English we speak of laughing till our sides ache. Compare Milton, L'Allegro 32, And Laughter holding both his sides.

³⁹Compare also Aen. 1.502 *Latona tacitum pertemptant gaudia pectus*.

⁴⁰'airs'.

In 5.91-92, he writes:

Disce, sed ira cadat naso rugosaeque sanna,
dum veteres avias tibi de pulmone revello.

As was the case with the organs of the trunk, a large number of strange ideas arose with regard to the head. The ancients were slow to recognize that the head is the seat of our intellectual faculties.

A superficial deduction as to the center of a bodily function occurs in Pliny, N. H. 11.135. Because the head nods in sleep, he concludes that sleep proceeds from the brain. He explains that those creatures which have no brain never sleep.

One would naturally suppose that the word *cerebrosus* would mean 'brainy', yet it means 'angry', in the following quotation: *donec cerebrosus prosilit unus ac mulae nautaeque caput lumbosque saligno fuste dolat* (Horace, *Serm.* 1.5.21-23)⁴¹. This use is probably a reflection of Greek ideas. In *Il.* 1.103-104, the mind is dark with passion, which is conceived of as an enveloping cloud.

Pliny, N. H. 11.145, after noting how the eye more than any other organ affords an index to the many moods of the mind, concludes: *Profecto in oculis animus habitat*. His words are, however, not to be taken seriously, since the next paragraph informs us that it is with the mind that we see, and that it is the function of the eye to receive and transmit impressions.

As might be expected, feelings of pride are located in the highest part of man. After stating that the eyebrows serve in some measure to indicate our feelings, as when we assent or dissent, Pliny continues, N. H. 11.138:

'Pride has its beginnings elsewhere, but it is here <i. e. in the eyebrows> that it has its seat. It originates in the heart, but it mounts to the eyebrows and there abides. No place higher, and at the same time more inaccessible, could it find in which to be alone'.

The word *frons* is sometimes used in the sense of modesty or restraint, a proof that the brow was regarded as one of the seats of these characteristics. Persius 5.102-104 provides a good illustration. Compare Juvenal 13.242: *quando recepit eiectum simul attrita de fronte ruborem?* In English the word 'affront' and the figurative uses of 'face', 'front', and 'forehead' indicate the opposite of restraint or modesty, while 'frontless' and 'effrontery' reflect Latin usage.

The ear, too, has its associations. In it was placed the seat of memory: *Est in aure ima memoriae locus quem tangentes antestamur* (Pliny, N. H. 11.251). Servius, likewise, in a comment on Vergil, *Eclogues* 6.3, notes that the ear was consecrated to memory. There have come down to us cameos representing a hand touching the ear. At the top of them are the significant inscriptions, *MEMENT (sic)* or *MNHMONETE*⁴².

Numerous allusions to this belief are found in Latin literature. I shall quote but two: *Cynthus aurem*

vellit et admonuit (Vergil, *Ecl.* 6.3-4); *Mors aurem vellens, "Vivite", ait, "venio"* (Copa 38)⁴³.

As indicated by the quotation from Pliny, the Romans touched the ear when they served a subpoena. Response to the summons was made by 'offering the ear'; compare *ego vero oppono auriculum*, Horace, *Serm.* 1.9.76. The person subpoenaed allowed his ear to be touched as a sign that he would remember.

It was also believed that behind the right ear was the seat of Nemesis. This place the Romans touched when asking forgiveness of the gods⁴⁴.

English poetry has been affected by Latin usage. Thus Herrick writes, in *Dissuasions from Idleness*:

Cynthus pluck ye by the ear
That ye may good doctrine hear⁴⁵.

An interesting analogy is found in German, which speaks of writing a thing behind the ear, *sich etwas hinter die Ohren schreiben*. Only recently I saw in a New York German newspaper *in die Ohren* used in connection with *schreiben*⁴⁶.

The origin of the Roman idea admits of a ready explanation. In antiquity, when books were comparatively scarce, the ear rather than the eye was the natural avenue of information. In addition, a person who does not listen attentively does not remember well (compare 'in one ear and out the other').

One is rather surprised to find that the tingling of the ears indicated to a Roman that some one was talking about him: *Quin et absentis tinnitu aurium praesentire sermones de sese receptum est* (Pliny, N. H. 28.24). Not less surprising is the tingling of a Greek's ears on recalling some one else: see *Aristaenetus*, *Epp.* 2.13.

The nose was a familiar seat of anger: *Disce, sed ira cadat naso* (Persius 5.91). See also *Theocritus* 1.18.

One of the strangest customs of antiquity was that of saluting a person who sneezed. At the banquet of *Trimalchio Eumolpus* sneezed three times, without stopping, so that he shook the couch; thereupon *Eumolpus* turned and bade the guests say *Salve* to *Giton* (Petronius 98).

'Why do we say *Salus* when people sneeze⁴⁷, an observance which *Tiberius*, the grouchiest of mortals, as is generally admitted, used to exact when in his chariot, and why do some persons think it more auspicious to say *Salus*, using the name as well?'

An answer to Pliny's question can be found in *Aristotle*, *Problemata* 33.7. He makes two explanations, according to the first of which the Greeks considered the sneeze to be a god, because it occurs in the head, which is the seat of reason, and hence the most divine part of

⁴¹For other instances, see Otto, *Die Sprichwörter und Sprichwörtlichen Redensarten der Römer*, s. v. *auris*. See also Sittl, *Die Gebärden der Griechen und Römer*, 146.

⁴²Pliny, N. H. 11.251; Alexander ab Alexandro 4.26.

⁴³See also Milton, *Lycidas* 77.

⁴⁴Compare Italian *Tirar gli orecchi ad uno*, 'to admonish a person'.
⁴⁵Pliny, N. H. 28.23. It seems clear that in this connection *salutare* means 'to say *salus*'. Cicero, *Cat.* 2.12, says of *Catiline*, *quis eum senator appellavit, quis salutavit?* This means that no senator addressed him by name, or said *salus* (perhaps *Salve*) to him.

⁴⁶Compare *furiata mente*, Aen. 2.588.

⁴⁷See Le Blant, *Mélanges d'Archéologie*, 3.36, Plate 1.6, 7.

the body. Therefore the Greeks, when they sneezed, said Ζεῦ, σῶσον⁴⁸. Compare the French, Dieu vous bénisse⁴⁹.

The second suggestion is that affections in general come from sickness, but that sneezing does not. In fact Hippocrates, Prog. 14, tells us that as a rule sneezing is a salutary symptom. We know that sternutatories were recommended by physicians, and that, when sternutation was induced, it was regarded as a sign of convalescence.

Both explanations fit Greek and Latin alike. The first is theological, when sneezing is a good omen for a project or undertaking. The second is physiological, and the idea is that sneezing is indicative of health⁵⁰.

In the cheeks is placed the seat of modesty⁵¹. The reason is patent; Pliny, N. H. 11.157, says, Pudoris haec sedes; ibi maxime ostenditur rubor. Some such idea seems to have been prevalent in Shakespeare's day, as is indicated by a passage from Othello 4.2.74-76:

I should make very forges of my⁵² cheeks,
That would to cinders burn up modesty,
Did I but speak thy deeds.

UNIVERSITY OF TEXAS. EUGENE S. MCCARTNEY.
(To be concluded)

CORRESPONDENCE

I

I have read with much satisfaction the advice of C. K. (THE CLASSICAL WEEKLY 10.81-82, 89-90, 97-98) to read Latin aloud, which I can support from my own experience. But I venture to offer a word of caution. I hope C. K. will reconsider¹ his remark (10.97), that in reading verse, the ictus must be treated as stress; "We can read verse", he adds, "Latin or English, in no other way". There is probably some printer's error here, for it is obvious to every one that English verse is not read in this way, i. e. by putting stress on the second syllable of each pair in blank verse; if the words in the verse have a different accentuation from their ordinary one, that offends every ear, and justly, and to read verse in that way makes a monotonous jog trot—"the butter-woman's jog to market", as Shakespeare calls just this habit.

It is the same in Latin. The words in Vergil must be accented exactly as they are in Livy or Cicero; and the rhythm of the verse depends on the length or shortness of the vowels, the heaviness or lightness of the syllables, and the subtle interplay of accent with the feet which I now proceed to exemplify.

⁴⁸For some historic sneezes, see Od. 17.541; Xenophon, Anab. 3.2.9.

⁴⁹Compare also German Gesundheit; Italian Salute, also Felicità, Figli maschi; French Bonne Sante; Scotch and Irish, God bless you.

⁵⁰On the subject of sneezing see Tylor, Primitive Culture, 1.97 ff.; Brand, Popular Antiquities (1813), 2.456-462; A. S. Pease, The Omen of Sneezing, in Classical Philology 6.429-443. A readily accessible discussion of the subject can be found in W. C. Hazlitt, Dictionary of Fables and Folk-Lore.

⁵¹In English the word 'cheek' may be used figuratively for 'forwardness', 'impudence', and 'effrontery'.

⁵²Perhaps 'thy' should be read.

¹I have 'reconsidered' the remark, in one sense of that verb, but I do not withdraw it. C. K.

The Latin accent, as we know, fell in each word on the last syllable but one if that syllable was long, on the last but two otherwise; never anywhere else, except that certain phrases are treated as one word (e. g. -que is enclitic, prepositions form one group with their nouns). Now if we mark the word accents in Vergil, we find that in the first four feet they tend not to fall with the ictus, but in the last two feet they do. There is only one line² in the Aeneid where all six correspond, but there are several in the fragments of Ennius; for Ennius did not learn how to reconcile the new Greek meter of quantity with a language that had stress-accent. It was Vergil who found out the way to do that. English hexameters fail because every line is like Ennius's *cum legionibus iam profisciscitur induperator*, and, consequently, it bores us to extinction, and I doubt if any man with a sensitive ear could endure to hear Evangeline read aloud.

That is what we must not do to Vergil, or we murder him.

But the proper pronunciation of quantity needs the greatest care. Very few scholars, even distinguished scholars, really know the difference between long and short, although they are all indignant if you dare to hint as much. I have taught my ear to distinguish these with painstaking practice, and now I do know, and I can explain it to any one who does me the honor to listen; but I cannot always convince Mr. A. or Mr. B. that *he* is confusing stress with length when *he* speaks, because of his inveterate habit. I can do it for schoolboys, however, with the greatest ease, if I begin at the beginning; and, if any reader of these lines will visit my School, I will show him in five minutes the whole thing, and he shall have not only Vergil read so as to bring out his rhythm (a thing I never heard in all my life until I taught myself and others to do it), but Homer with quantity and *pitch*-accent. Believe me, it is worth the trouble.

PERSE SCHOOL, CAMBRIDGE.

W. H. D. ROUSE.

The foregoing communication has been in my hands for some time. On receipt of it, I at once wrote to Dr. Rouse, acknowledging that the paper had come to hand, and saying that I should publish it later, with some comments. To that suggestion he made no objection.

Dr. Rouse's position makes one think of Professor Bennett's views with respect to the reading of Latin verse, set forth in his pamphlet *The Quantitative Reading of Latin Poetry* (Allyn and Bacon, 1899; pp. iv + 46), previously elaborated in various contributions to the *American Journal of Philology*: 19 (1898), 361-383, *What was Ictus in Latin Prosody?*; 20.412-428 *Rhythmic Accent in Ancient Verse*. A Reply. The latter paper was a reply to an article by Professor Hendrickson, A. J. P. 20. 198-210, a review of Professor Bennett's earlier paper. Professor Bennett's rejoinder brought forth a second paper from Professor Hendrickson, in

²On this see Mr. E. J. Brooks and Dr. Rouse, in *The Classical Review* (articles referred to in my remarks below, page 30, column 1). C. K.



Some Folk-Lore of Ancient Physiology and Psychology (Concluded)

Author(s): Eugene S. McCartney

Source: *The Classical Weekly*, Vol. 12, No. 5 (Nov. 11, 1918), pp. 35-38

Published by: [Classical Association of the Atlantic States](#)

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THE CLASSICAL WEEKLY 10.217-220, concluded by pointing out how much of the Classics he found in a single copy of a newspaper, published in the midst of our last Presidential campaign. This reminds me of a fine paper by Professor Kent, of which mention should have been made long ago. It is entitled Latin and Greek in the Newspapers, and appeared in the Alumni magazine published at the University of Pennsylvania, formerly known as Old Penn, but now called The Pennsylvania Gazette. See volume 15.386-390 (March 30, 1917). This paper, read at the Fourth Annual Meeting of The Philadelphia Society for the Promotion of Liberal Studies, presents an astonishing array of evidence that to the writers in the Philadelphia newspapers, at least, the Classics are not dead, and that these writers have no fear that the Classics are dead to their readers.

C. K.

SOME FOLK-LORE OF ANCIENT PHYSIOLOGY AND PSYCHOLOGY

(Concluded from pages 21, 29)

We have now noted the beliefs connected with the organs of the lower and the upper trunk cavity and with the head. There remain to be discussed certain elements of our physical constitution which are common to the whole body, namely, the humors, bones, nerves, flesh, and skin.

From the time of Hippocrates the ancients believed that there were four cardinal fluids of the body—*sanguis*, *cholera* or yellow bile, *melancholia* or black bile, *phlegma* (Isidorus, Origines 4.5).

These four liquids were known as *humors* (*humor* being the Latin word for 'liquid'), and good health was thought to depend on the maintenance of a just proportion among them. The balance or commixture of the humors was known as a man's *temperament*, that is, his 'mixture' (L. *tempero*, 'to mix')⁵², or as his *complexion* (from a Latin word meaning 'combination', derived from *com-*, 'together', and *plecto*, 'to weave'). Thus if a man had more blood than any other humor in his system, he was said to be of a *sanguine* temperament or complexion (L. *sanguis*, 'blood'); if more bile, of a *bilious* temperament or complexion; if more phlegm, of a *phlegmatic* temperament; if more melancholy (or black bile), of a *melancholy* temperament. If the temperament, or balance of the humors, was greatly disturbed, the result was *distemper*⁵³, that is, a 'variance from the proper mixture'⁵⁴

Temper, however, which was a synonym of *temperament*, has taken a different course. We use it vaguely for 'disposition', but commonly associate it in some way with 'irascibility'. 'Keep your *temper*', 'he lost

his *temper*', 'ill-tempered'⁵⁵, show a trace of the old meaning; but the colloquial 'What a *temper* he has!', 'He is in such a *temper*!' would never be referred to physiological science by one who did not know the history of the word.

Upon the blood depended sweetness of disposition and geniality: *Sanguis Latine vocatur quod suavis est, unde et homines, quibus dominatur sanguis, dulces et blandi sunt* (Isidorus, Origines 4.5.6). The blood was aided and abetted by the bile in producing ill humor: *Ex sanguine et felle acutae passionis nascuntur, quas Graeci δξεία vocant* (Isidorus, 4.5.7)⁵⁶.

These beliefs are reflected indirectly in English by such expressions as good humor, ill humor, in humor (obsolete), out of humor, vein of humor⁵⁷.

As might be expected, passionate love is occasionally represented as having its abode in the blood; compare Aen. 4.1-2. One can compare with this Bassanio's words addressed to Portia, M. V. 3.2.178: Only my blood speaks to you in my veins.

There are still other popular notions connected with the blood. According to Pliny, N. H. 11.221, animals with abundant rich blood are irascible; those with thick blood courageous; those with thin blood intelligent; those with little or no blood timid⁵⁸. Pliny adds, 11.226, that there are persons who believe that the keenness of the mind does not depend upon the thinness of the blood⁵⁹. Empedocles was numbered among those who attributed acuteness or bluntness of intellect to the quality of the blood⁶⁰.

Pliny further informs us, N. H. 11.224, that the blood spreading over the face indicates changing mental attitudes, by depicting shame, anger, and fear through the varying degrees of pallor and redness. So much is true, but our author adds that the redness

⁵²Compare Julius Caesar 4.3.113-115 Hath Cassius lived To be but mirth and laughter to his Brutus, When grief and blood ill-tempered vexeth him?

⁵³Such notions about the blood are frequently found in Shakespeare. The following quotations from II King Henry IV are worth citing: 2.3.30 humours of the blood; 4.3.34 as humorous as winter. There is a close connection between one's disposition and the blood. Compare 4.4.38 When you perceive his blood inclined to mirth. The opposite side of one's nature is likewise affected. Compare 4.4.63 When rage and hot blood are his counsellors; 4.5.38 Thy due from me is tears and heavy sorrows of the blood.

Another illuminating instance is to be found in Julius Caesar 4.3.119-121:

Have not you love enough to bear with me
When that rash humour which my mother gave me
Makes me forgetful?

⁵⁷"A diseased condition of any one of the four humors might manifest itself as an eruption on the skin; hence such an eruption is still called a *humor* in common language. Again, an excess of one of the humors might make a man odd or fantastic in his speech and actions. Thus *humorous* took the meaning 'eccentric', and a '*humorous* man' was what we call, in modern slang, 'a crank'. The 'comedy of humors', of which Ben Jonson is the best exponent, found material in caricaturing such eccentric persons. From this sense, *humor* had an easy development to that of 'a keen perception of the odd or incongruous', and we thus arrive at the regular modern meaning of the word. It is certainly a long way from *humor* in the literal sense of 'liquid' or 'moisture' to *humor* in the sense in which that quality is so often associated with wit" (Greenough and Kittredge, Words and their Ways in English Speech, 32-33).

⁵⁸Compare figurative uses of 'warm-blooded', 'cold-blooded', 'sanguine'.

⁵⁹Compare 'Blood will tell'.

⁶⁰Sed Empedocles causam argutae indolis et obtusae in sanguinis qualitate constituit (Tertullian, De Anima 20).

Compare King Lear 3.1.40 I am a gentleman of blood and breed-ing.

⁵²Compare Ben Jonson, Cynthia's Revels, 2.3 A creature of a most perfect and divine temper, one in whom the humours and elements are peaceably met, without emulation of precedence.

⁵³This word may be used of either physical or mental condition. Thus Shakespeare writes, II King Henry IV 3.1. 41-43:

It is but as a body yet distemper'd;
Which to his former strength may be restored
With good advice and little medicine.

Hamlet's madness is called a distemper. Compare also Tempest 4.1.145 touch'd with anger so distemper'd. So Franklin says in his Autobiography, My distemper was a pleurisy which very nearly carried me off.

⁵⁴The quotations are from Greenough and Kittredge, Words and their Ways in English Speech, 30-31, 32.

of anger is one thing, and the blush of modesty another. According to his view, a person blushes, as we have shown before, because the cheeks are the seat of modesty.

The ancients believed that the blood was pumped through the body in veins, and that the arteries were air-ducts; sanguis per venas in omne corpus diffunditur et spiritus per arterias (Cicero, N. D. 2.138; Pliny, N. H. 11.182, 218)⁶¹. Ignorance of the facts of circulation naturally caused other misconceptions. It led to the localization of the seat of modesty in the cheeks. It gave birth, likewise, to the notion that the arteries were air-passages, a mistake to which the very word artery (*ἀρτηρία*, Latin *arteria*) is a monument more enduring than bronze⁶².

Ancient physiology supposed that the *spiritus* passing through the arteries vitally influenced the processes of life.

It is in unconscious obedience to this superannuated science that we use such words and phrases as 'in high (low, good, bad) *spirits*', *high-spirited*, *low-spirited*, 'a *spirited* horse', 'a *spirited* performance', and that we speak of one who is spontaneously merry as having 'a great flow of *animal spirits*'⁶³.

A large body of beliefs grew up in connection with the flesh also. The view was current in antiquity that sin and many forms of weakness were due to the *caro*. No set of notions connected with any organ, except the heart, has left a stronger impress upon language, especially ecclesiastical literature. Even in Latin pagan works the idea of the conflict between the spirit and the flesh is well developed. The *corpus* or *caro* is regarded as the seat of the baser passions.

Seneca, Epp. 7.3.22, says of the body: 'In this hateful abode the mind dwells free; never shall this flesh drive me to fear, never to insincerity unbecoming to a good man'. He states further, in Epp. 7.3.20, that he is too great, and born to too noble a destiny, to permit his becoming a slave to his body. Other passages in Seneca are equally significant; compare e.g. Epp. 8.73.16 Summum bonum in animo contineamus. . . . Non est summa felicitatis nostrae in carne ponenda. The following sounds very much like the utterance of a Church father: Omne illi <=animo> cum gravi carne certamen est, ne abstrahatur (Consolatio ad Marciam 24).

Such usage paved the way for the expressions so common in the Latin of the New Testament and of the ecclesiastical writers. The following are typical instances from the Bible: Caro concupiscit adversus spiritum, spiritus autem adversus carnem (Gal. 5.17); Spiritus quidem promptus, caro vero infirma (Mark 14.38).

⁶¹Compare Love's Labour's Lost 4.3.305 The nimble spirits in the arteries.

⁶²In English we have several expressions that reflect ancient mistakes. We say that a person has French blood in his *veins* (not in his arteries). The blood was one of the 'humors' of the body; hence we speak of a 'vein of humor', not an 'artery of humor'. It is significant that the Spaniard designated a certain class of aristocrats as 'blue bloods', and not as 'red bloods'.

⁶³Greenough and Kittredge, Words and their Ways in English Speech, 33.

No more sweeping statement of the attitude toward the flesh can be found than in Tertullian, Resurr. 15: In carne et cum carne et per carnem agitur ab anima quod agitur in corde.

There are two probable explanations of these beliefs. The ancients regarded the human body as composed of four elements, air in the breath, fire in the heat, moisture in the blood, earth in the flesh. As in the physical universe the basest element is earth, so in the body the flesh is regarded as the basest part, and hence is a fit abode for the passions.

The other explanation carries us back to a time when the function and the existence of nerves were unknown. Since pleasures and pains are felt locally, it was concluded that the seat of sensation is in the flesh⁶⁴. Hence we say that the spirit is willing, but the flesh is weak.

It was the opinion of some in antiquity that a thick skin indicated stupidity (compare English 'thick-skinned', 'thick-skulled'), a view that Pliny, N. H. 11.226-227, refutes to his own satisfaction by citing the cunning of the crocodile and the intelligence of the hippopotamus and the elephant⁶⁵.

The custom of embracing the knees is due, according to Pliny, N. H. 11.250, to a strange notion:

'Suppliants clasp the knees, they stretch their hands to them, they adore them as they do altars, perhaps because the knees are the seat of vitality. For exactly at the front of either knee, right as well as left, there is a kind of opening like that of a mouth. From this, if pierced, the vital spirit escapes as from a throat'.

The knees were consecrated to *misericordia*, just as the ear was to memory (Servius, on Vergil, Ecl. 6.3).

Several ideas were associated by the ancients with the marrow. Perhaps they thought it exercised a profound influence on life since Nature took such pains to enclose it in a hard casing. In the oldest tradition it was a seat of life, as we see from Od. 3.455.

Among the Romans the seat of life is not assigned to the marrow, but some of the deeper and more vital manifestations of emotional life are placed in it. Thus we find in Cicero, Phil. 1.36, in medullis populi Romani ac visceribus haerebant. Compare Ovid, Trist. 1.5.9 Haec mihi semper erunt imis infixae medullis.

Vergil makes the marrow the seat of some of the deeper feelings, as love, fury, grief and fear. Thus the flame of love eats at the marrow of Dido: Aen. 4.66; 1.660. In another instance, Aen. 4. 101, when Dido is represented as madly in love, she arouses fury in her bones. Great grief burns in the bones of Gyas: Aen. 5.172. So, too, fear may be felt in the bones: Aen. 6.55-56.

Harpers' Dictionary regards the secondary uses of *medulla* as tropes. But few of them, it seems to me, are to be taken as such, in the ordinary sense of the

⁶⁴Aristotle regarded the flesh as the seat of feeling. See Zeller, Outlines of Greek Philosophy, 203.

⁶⁵Compare the English use of 'pachyderm' as applied to dullards.

term trope. I believe that an orator is called 'the marrow of eloquence'⁶⁶, not because of any similarity between eloquence and marrow, but because the marrow was supposed to be the seat of some of the deeper feelings which he succeeded in arousing.

Popular fancy seems to have played but little part in attributing functions to the nerves as such, for the simple reason that the existence of the nerves was not generally known among the laity. Even the Egyptian story already quoted from Gellius to the effect that rings are worn on the finger next to the smallest one, because there is a delicate nerve connecting it with the heart, is a matter for antiquarian research. Aristotle is said to have been unaware of their presence in the human body⁶⁷. Hippocrates, however, knew of nerves as distinguished from tendons and ligaments⁶⁸. There are, nevertheless, popular uses of the word *nervi* in the sense of 'sinews'.

When Cicero, Phil. 5.2.5, speaks of money as the sinews of war, *nervi belli pecunia*, it is clear that this use of *nervi* is a trope. When, however, he says, Verr. 2.3.56, *omnibus nervis mihi contendendum est*⁶⁹, I question whether the use is, historically speaking, tropical, as the dictionaries regard it. It seems preferable to believe that such usage is due to the feeling that in the *nervi* lies strength. Thus Persius says (1.45) *Decipe nervos*, 'Cheat your nerves (sinews)', which means, 'Cheat yourself into believing that you are sound and strong'.

Solinus, 1.7, expresses the common view: *Maximam virium substantiam nervos facere certissimum est, quantoque fuerint densiores, tanto propensius augescere firmitatem*. Solinus then proceeds to quote Varro. The latter marvels at the ruggedness of a Samnite who was a born gladiator, and states that many of his victories were due to the lattice-work of straight and transverse *nervi* on his breast. It may be noted, too, that *enervare*, 'to remove the sinews', means 'to weaken'⁷⁰.

With advances in the science of anatomy, the word *nervus* modified its meaning, but the old idea which attributed strength to the *nervi* has left its impress upon the Romance words for 'nerve'. French *nerf*, Spanish *nervio*, and Italian *nervo* all mean 'strength'

or 'vigor' as well as 'nerve'. The Spanish can say, *fuerte como un manojo di nervios*, 'strong as a bundle of nerves'.

I believe I have now noted the main misconceptions about the seats of our physical, intellectual and psychological life. I have also called attention to their effect upon the language and the customs of the Romans. I shall add an additional group of popular notions which were committed to writing in a most perfunctory fashion by a Latin author.

Pliny, after recording with approval in the eleventh book so many popular fallacies and beliefs, hesitates to be sponsor for certain others that tax even his credulity, and so he shifts the responsibility to Aristotle and Trogus: see 11.273-276.

'I marvel not only that Aristotle believed that there are in the human body certain prognostics of life, but that he went so far as to set them down. Although I believe them worthless, and think they ought not to be published without hesitation, lest each person should anxiously seek out these indications in his own case, I shall in spite of all touch upon them, since so learned a man did not reject them. He has, then, recorded as indications of a short life, a small number of teeth, abnormally long fingers, a leaden color and numerous broken lines in the palm; on the other hand he regards as signs of long life curving shoulders, one or two long unbroken lines in the hand, the presence of more than thirty-two teeth, and large ears. He puts significance, I think, not in all of these signs taken together, but in the isolated occurrence of any one of them. These beliefs are foolish, if you want my opinion, yet they are widely current.

In a similar manner amongst us a description of character as indicated by the physiognomy has been set forth by Trogus, although he is one of the most conservative writers. I shall let him speak for himself⁷¹. "When the forehead is large, it indicates a sluggish mind underneath; when small, a fickle disposition; when round, an irascible temper, a visible sign, as it were, of a swelling tumor beneath. Eyebrows extending in a straight line are indications of weakness; when turned down toward the nose they are a sign of austerity; when inclined toward the temples, they point to a sarcastic disposition; when they are very low, they denote envy and malice. Long eyes indicate a spiteful nature; fleshy corners of the eyes next to the nose furnish a sign of wickedness. The white of the eye when large is a sign of impudence; those who are forever working the eyelids are fickle. Large ears are a sign of loquacity and foolishness"⁷².

After completing the quotation Pliny again reminds the gentle reader that it is only a quotation.

There are, of course, other instances of folk-lore in connection with ancient anatomy and physiology, but I have in general confined myself to those beliefs which mistakenly assign physical, intellectual, and psychological attributes to certain parts of the body. The article is not exhaustive even in the range to which I have limited it, but it is hoped that it will shed

⁶⁶*Suadæ medulla*, Quintilian 2.15.4; Cicero, Brutus 59.

⁶⁷Zeller, *Outlines of Greek Philosophy*, 203.

⁶⁸Galen 5.205 (edition of Kühn).

⁶⁹Compare Love's Labour's Lost 1.5.303 The sinewy vigour of the traveller.

⁷⁰Nerve once meant 'sinew' (L. *nervus*), as in Shakespeare's 'hardy as a Nemean lion's nerve'. Nervous was therefore 'vigorous',—a sense which remains in 'a nervous style' or a 'nervous writer'. With the advance of physiology, however, the name nerve received a different sense, with the result that, in ordinary use, nervous suggests almost the opposite of sinewy strength. It is worth notice that we have transferred to nerves in the modern sense a number of expressive words which are literally applicable to the muscles and the sinews. Thus we speak of 'nervous tension', and say 'every nerve was tense with excitement', or in the vernacular, 'his nerves were on the stretch'. Compare 'nervous strain'. 'To lose one's nerve' is really 'to lose one's sinewy fibre', to become weak and 'flabby'. In modern usage, a man 'loses his nerve' in proportion as he becomes conscious that he has nerves,—a curious contradiction, but natural enough when we know the history of the word'. (Greenough and Kittredge, *Words and their Ways in English Speech*, 213).

⁷¹Trogus is, however, indebted to Aristotle, *Historia Animalium* 1.9 ff.

⁷²A large and interesting collection of material of this character is to be found in P. R. Foerster, *Scriptores Physiognomici Graeci et Latini*.

fuller light on many passages of Latin literature and incidentally on modern forms of expression⁷³.

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REVIEW

Roman Craftsmen and Tradesmen of the Early Empire. University of Pennsylvania Dissertation. By Ethel Hampson Brewster. Menasha, Wisconsin: George Banta Publishing Co. (1917). Pp. xiv + 101.

It is the writer's aim, therefore, to discuss Roman craftsmen and tradesmen as depicted by the satiric writers of the early Empire. The expression, 'satiric writers', is adopted in order to include not only Horace, Persius, and Juvenal, but also Petronius and Martial; In lieu of a more comprehensive term, 'craftsmen' is used to designate those whom the Romans called *opifices*. An attempt has been made to investigate in the authors above mentioned all passages relevant to our subject; to incorporate the information secured into a connected account, with the aid of references from other sources by way of comparison or elucidation; and finally, to use this material as a basis for determining, so far as possible, the social status of Rome's industrial population during the period in question.

According to these words of Dr. Brewster (page xiii) her dissertation should be of interest especially to two classes of students—students of Roman satire, from which her material is largely drawn, and students of Roman private life and economic history, to which fields her conclusions most largely contribute.

By the familiar analytic, alphabetic method, to which we are now so accustomed in the dissertation form, the author classifies under twenty-six heads the craftsmen and tradesmen of Rome:

I Aerarii Ferrarii; II Argentarii; III Aurifices; IV Caelatores; V Caupones; VI Centonarii; VII Cerdones; VIII Coci; IX Coriarii; X Dendrophori; XI Fabri; XII Ferrarii; XIII Figuli; XIV Fullones; XV Institores; XVI Lanii; XVII Mangones; XVIII Mercatores; XIX Negotiatores; XX Pistores; XXI Praecones; XXII Sutores Cerdones; XXIII Tabernarii; XXIV Textores; XXV Tignarii Collegia Fabrum Centonariorum Dendrophorum; XXVI Tonsores.

Many of these trades run one into another. Concerning the majority the satirists give but little evidence, and usually of an inconclusive sort. Often where they pour praise or contempt upon a tradesman, it is difficult to determine whether the measure be the trade or the man or both. Guilt here, as elsewhere, is usually personal rather than occupational. Still there is the old taint of trade: the Republican prejudice continues; and noteworthy is the tradesman who through personal worth or commercial success rises

above his traditional social status. Dr. Brewster's work is very frankly a bit of special pleading for the "butcher, the baker, the candlestick-maker" of Imperial Rome. She has not always succeeded in winning a favorable verdict for her client; but in more than one case she has thrown the burden of proof on the complainant by a skillful cross-examination of the principal witness.

For example, butchers and the industrial population in general have been maligned because of Livy's denunciation of C. Terentius Varro (22.25.18 f.):

Loco non humili solum sed etiam sordido ortus. Patrem lanium fuisse ferunt, ipsum institorem mercis, filioque hoc ipso in servilia eius artis ministeria usum.

But, as Dr. Brewster shows (28–29), Livy complains chiefly, not that Terentius was the son of a butcher, but that his father had, like a slave, peddled his own meats, and had compelled his son to do the same. Dr. Brewster's conclusion (29) is as follows:

Since, therefore, the heaviest aspersions in the passage seem to be directed against a slave's occupation and a lawyer's dishonesty, they cannot fairly be cited as committing *lanii* and other tradesmen to the depths of social disgrace and degradation. All that is clearly proved is that butchers were of humble station. . . .

Similarly, also, Dr. Brewster has rehabilitated the *praecon* (44–53). The principal aspersions on the auctioneer's business are based on a provision of the Lex Iulia Municipalis, with Cicero's comment thereon (49–50). How is *praeconium* in the law to be interpreted? Cicero's statement does not help us. It seems clear from the context in which the word occurs, *qui praeconium dissignationem libitinamve faciet*, that the ban was placed upon *praecones* as attendants upon funerals, not as ordinary auctioneers. As the other two functionaries are the funeral marshal and the undertaker, so the *praecon* who might not hold the office of decurion in municipalities, colonies, or prefectures was the functionary whose part Phormio assumes when in Terence, Phormio 1026, he invites the audience to attend the funeral of Chremes: *Exsequias Chremeti quibus est commodum ire, em! tempus est*.

The rehabilitation of Echion, commonly called 'the rag-picker', will prove interesting to students of Petronius (81–82):

Surely <he> is more than a 'rag-dealer'; interpreted as a prosperous canvas manufacturer, perchance even a member of the local fire department, this character assumes grander proportions, and we can well understand his optimism, his pride in his country and his boys, and his effervescent sense of importance.

In this connection the vexed problem of the *collegia fabrum centonariorum dendrophorum* is well handled (86):

The *collegium fabrum* with its adjuncts, then, appears to have been a well-equipped and highly organized Department of Public Safety, charged with guarding against fires and upholding the peace. Presumably, the *fabri* made and manipulated the apparatus; the *centonarii* manufactured canvas, piecing it together to

⁷³A few lines from Shakespeare, Julius Caesar 4.3.42–47, will illustrate very clearly how ancient notions have survived:

All this! ay, more: fret till your proud heart break;
Go show your slaves how choleric you are,
And make your bondmen tremble. Must I budge?
Must I observe you? must I stand and crouch
Under your testy humour? By the gods,
You shall digest the venom of your spleen.



Spontaneous Generation and Kindred Notions in Antiquity

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Reviewed work(s):

Source: *Transactions and Proceedings of the American Philological Association*, Vol. 51 (1920), pp. 101-115

Published by: [The Johns Hopkins University Press](#)

Stable URL: <http://www.jstor.org/stable/282874>

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VIII. — *Spontaneous Generation and Kindred Notions in Antiquity*¹

By DR. EUGENE S. McCARTNEY

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THE doctrine of spontaneous generation, or, as it was named by Huxley, abiogenesis, originated in remote antiquity, flourished throughout ancient times and the Middle Ages, and lasted until modern times. As late as 1870 it still possessed sufficient vitality to interest the British Association for the Advancement of Science. In that year in his presidential address Huxley gave a summary of the investigations by which it was refuted.² In view of the millennia during which the belief in abiogenesis persisted, its historical importance in connection with biology, and the association with it of names like Aristotle, Pasteur, and Huxley, it seems worth while to write in some detail the initial chapter in its history.

In historic Greek antiquity³ the existence of every species of animal the sex history of which was not known, was accounted for by spontaneous generation or some kindred notion. This theory was necessarily resorted to in the case of those insects and animals of which the female⁴ was supposed to be lacking, or the male,⁵ or both male and female,⁶ or which for

¹ The following abbreviations are used in this article for works frequently referred to: *H.A.*, Aristotle, *Historia Animalium*; *G.A.*, Aristotle, *de Generatione Animalium*; *Ael.*, Aelian, *de Natura Animalium*; *Pl.*, Pliny, *Naturalis Historia*; *Isid.*, Isidorus, *Origines*. I have used Thompson's translation of the *H.A.* and Platt's rendering of the *G.A.*

² See the *Scientific Memoirs of Thomas Henry Huxley*, III, 572-594.

³ There are two Mycenaean vases which it is not unreasonable for us to look upon as our earliest evidence of the existence of the doctrine of spontaneous generation. On them we see various animals springing into existence. For illustrations and description of the vases, see Perrot-Chipiez, *Art in Primitive Greece*, II, 390-399.

⁴ *E.g.*, the scarab, *Ael.* x, 15; the tiger, *Tzetz. Chil.* XII, 731.

⁵ *E.g.*, the vulture, *Ael.* II, 46; some species of fish, *H.A.* 539 a 29, *Pl.* IX, 56. As a result of the belief that there were no males among vultures, the Egyptians made that bird an emblem of nature (*Amm.* XVII, 4, 11).

⁶ *E.g.*, bees, *Aug. Civ. Dei*, xv, 27; salamanders, eels, shellfish, *Pl.* x, 189;

other reasons did not have the power of reproduction.⁷ Parthenogenesis⁸ and hermaphroditism⁹ were called upon to explain the existence of more creatures than the facts warrant.

With increasing knowledge one animal after another was probably removed from the list of animals whose origin was explained by the notions under consideration; but even philosophers assigned to abiogenesis the original creation of animals, and so apparently differed from their illiterate countrymen only in restricting its scope in their own day. Whenever Aristotle and the scientific men of his time were unable to find out the facts, or to formulate a plausible theory, they simply accepted the traditional popular opinion. For example, though the advanced thinkers of his day proposed the theory that bees originate from the union of the sexes, the great scientist makes merely cursory mention of their views, and then goes on to record what must have been prevailing popular notions (*G.A.* 759 a-b).

It is quite possible that ideas kindred to the notion of spontaneous generation may have been used by the remote ancestors of the Greeks to account for the perpetuation of the human species. Frazer, *Attis, Adonis, and Osiris*, 80 and 220, notes that the lowest existing tribes of Central Australia are not aware that offspring are the result of the union of the sexes, and expresses the belief that such ignorance may once have been universal among mankind. There were among the Greeks some time-honored ceremonies which seem to point to a past when the true nature of parentage was un-

certain insects and fish, *H.A.* 538 a 1-3 (cf. also *H.A.* 539 a 29), *G.A.* 741 b 1; *Testacea*, *G.A.* 715 b 18; a kind of mullet, *G.A.* 741 b 1.

⁷ *E.g.*, mules, *Aug. Civ. Dei*, xv, 27; small fish, *H.A.* 569 a 30.

⁸ *Chane*, a species of sea fish, *Ov. Hal.* 108. See Aubert und Wimmer, "Die Parthenogenesis bei Aristoteles," *Zeit. f. wiss. Zool.* ix (1858), 509-521; Georgievitch, "Parthenogenesis in Serbian Popular Tradition," *Folk-Lore*, 1918, 58-65.

⁹ *E.g.*, *τρώχος*, an unidentified animal, *G.A.* 757 a 5, Pl. ix, 166 (but compare ix, 56). For what seem to be hermaphroditic fish, see *H.A.* 538 a 18-22. Hares are said to possess the characteristics of both sexes and to be able to become pregnant without the aid of the male (*Archelaus*, ap. Pl. viii, 218).

known.¹⁰ At such a period may have originated the story that the mother of Attis was impregnated by an almond (Paus. VII, 17, 11), or, according to Arnobius (*adv. Nat.* v, 6), by a pomegranate. We find in Greek literature traditions hoary with age telling how man sprang from the oak tree, the ash tree, a stone, etc.,¹¹ notions which are after all only specific forms of the very general belief in autochthonous origin.

Aristotle says that if men and quadrupeds are really 'earth-born,' they came into existence either through the formation of a scolex, 'larva,' or else from eggs (*G.A.* 762 b 28). He eliminates the second alternative because he saw no animals being generated spontaneously from eggs, but did see (as he thought) insects and *Testacea* arising from the scolex (*G.A.* 763 a 4).¹²

Aristotle takes pains to express his own views about the process of spontaneous generation (*G.A.* 762 a 10). He maintains that animals do not originate from putrefied matter, but rather from an admixture of rain water with matter undergoing putrefaction. The sweet elements in this combination produce the animals, while the putrefied matter is the residue of the process. This view seems to be unique.¹³

Since insects are so small, it is not surprising that the sex history of some of them totally eluded the observation of the ancients. After naming a few whose manner of reproduction was known to him, Aristotle continues: "Other insects¹⁴ are

¹⁰ See Jane Harrison, *Prolegomena to the Study of Greek Religion* ², 122-124, and *Themis*, 266. For a comparative study of such physiological ignorance, see E. S. Hartland, *Primitive Paternity*, II, 249-286.

¹¹ See Preller, *Gr. Mythologie* ⁴, I, 78-87, and Sikes, *Anthropology of the Greeks*, 25 f.

¹² In order to keep this paper within reasonable limits, but scant attention is given to general theories and speculations about the original creation of animals by spontaneous generation. This material can be found in general works on Greek philosophy, and in the annotations on Lucretius, V, 771-924, where the poet formally sets forth his view of the origin of life.

¹³ Compare Lucr. II, 1156, Paus. VIII, 29, 4.

¹⁴ From the last few words of the quotation it will be seen that Aristotle's *ἐντομα ζῷα* is broader than the word 'insects' in English, including apparently all segmented creatures. In some of my notes to the quotation I have included

not derived from living parentage, but are generated spontaneously: some out of dew falling on leaves,¹⁵ ordinarily in springtime, but not seldom in winter when there has been a stretch of fair weather and southerly winds; others grow in decaying mud¹⁶ or dung,¹⁷ others in timber,¹⁸ green and dry; some in the hair of animals;¹⁹ some in the flesh of animals;²⁰ and some in excrement, not only after it has been voided,²¹ but while it is yet within the living animal, like the helminthes or intestinal worms²² (*H.A.* 551 a 1).

Still other insects originate from vegetation,²³ from worms, since the ancient words for worms, as well as the word 'worms' in popular meaning today, include the larvae of insects.

¹⁵ *E.g.*, caterpillars and many others, *Pl. XI*, 112. Dew was one means by which the sky-father impregnated the earth-mother: see Cook, *Zeus*, I, 733. The inhabitants of Imbros still pray for dew to fertilize man, plants, and animals (Harrison, *Themis*, 174).

¹⁶ *E.g.*, worms, *Sext. Emp. Hyp.* I, 41; lice, *H.A.* 557 a 22.

¹⁷ *E.g.*, grubs, *H.A.* 552 a 16 and 21; scarab, *Suid. s.v. κάνθαρος*; caterpillars, *Isid.* XX, 8, 8 (cf. *Pall.* IV, 15, 4).

¹⁸ *E.g.*, myops or horsefly, *H.A.* 552 a 29; worms, *Ael.* V, 3; *πιθήκη*, *ib.* VI, 26; wood fretter, *Pl. XI*, 66; a kind of tree larva and the gadfly or breeze fly, *ib.* XI, 113; a kind of gnat, *ib.* XV, 80. Worms are produced from putrefying sap, *ib.* XVI, 220.

¹⁹ *E.g.*, animalcules, such as the clothes moth, from wool, *H.A.* 557 b 1 (cf. *Pl. XI*, 115 and 117); *Taeniae*, from the hair of men, *Pl. XI*, 114.

²⁰ *E.g.*, lice, *H.A.* 556 b 29; gadfly from an animalcule, *ib.* 551 b 21; glow worm from caterpillar, *ib.* 551 b 23; gnats from ascarids, *ib.* 551 b 27; cockchafer from grub, *ib.* 552 a 15; a kind of beetle from grubs, *ib.* 552 a 19; flies from grubs, *ib.* 552 a 21; gnats from grubs, *ib.* 552 b 5; butterflies from caterpillars, *ib.* 551 a 13; 'stag beetles' from grubs, *ib.* 551 b 18; certain winged insects from grubs, *ib.* 552 a 18; tapeworms, *Pl. XI*, 113; ticks, *ib.* 116; a kind of beetle from caterpillars, *ib.* 118, *Ael.* IX, 39. Cf. *Sen. N.Q.* II, 31: *Fulmine icta (corpora) inter paucos dies verminant*.

²¹ *E.g.*, grub, *H.A.* 552 a 16; flea, *ib.* 556 b 25-27; wood fretter, *Pl. XI*, 65; worms, *Lucr.* II, 871-873.

²² *E.g.*, flatworm, round worm, ascarid, *H.A.* 551 a 9; tapeworms, *Pl. XI*, 114.

²³ *E.g.*, caterpillars from cabbage, *H.A.* 551 a 14; *όσσοδάκνα*, plant-eating insects, from cabbage stalks, *ib.* 552 a 30; cabbage worm from cabbage, *ib.* 551 b 19; leekbane from the leek, *ib.* 551 b 20 (cf. *Ael.* IX, 39), Antoninus Liberalis, 22; ticks from couch grass, *H.A.* 552 a 15; grubs from pulse, *ib.* 552 a 19; *Cantharides* from grain, *Ael.* IX, 39, *Pl. XVIII*, 152; *Cantharides* from flowers, *Pl. XI*, 118; gnats from leaves, *ib.* XVI, 29; worms from roots, *ib.* XVIII, 151; a kind of gnat from fig trees, *ib.* XI, 118; caterpillars from vegetation,

snow,²⁴ rain or a damp languid heat,²⁵ from used wash water,²⁶ foul water,²⁷ slime of wells,²⁸ slime of vinegar,²⁹ wine,³⁰ old wax,³¹ dried sweat,³² little sack-like objects on the river Hypanis,³³ from fire,³⁴ paper,³⁵ damp dust,³⁶ and books.³⁷ A most peculiar notion is the one which attributes the origin of the cicada to the spittle of cuckoos.³⁸ Another view for the origin of the cicada is the readily explainable one that it was born from the earth. In the days when the Greeks wore long hair, they clasped it with a golden cicada to indicate that they too were autochthonous.³⁹

The origin of a number of insects is ascribed to the carcasses of the larger animals. It was supposed that the hornet was generated in horses⁴⁰ or in mules;⁴¹ the wasp in asses⁴² or in horses;⁴³ drones in mules⁴⁴ or in horses;⁴⁵ scarabs in Sext. Emp. *Hyp.* I, 41; gall insects from wild figs, *ib.* See also Theophr. *H.P.* II, 8, 2-3; III, 12, 6; IV, 14, 2; IV, 14, 5; IV, 14, 10; V, 4, 5; VII, 5, 4; VII, 5, 6; VIII, 10, 1; VIII, 10, 4-5; VIII, 11, 2; IX, 5, 3.

²⁴ Worms, *i.e.*, the well-known snow fleas, snow worms, or glacier fleas (*Poduridae*), *H.A.* 552 b 8 (cf. Pl. XI, 118); Antig. 90.

²⁵ Caterpillars, Theophr. *H.P.* IV, 16; Pl. XVII, 229 (cf. *ib.* XI, 115).

²⁶ Pl. XI, 115.

²⁷ *Conopes*, Sext. Emp. *Hyp.* I, 41.

²⁸ Ascarids, *H.A.* 551 b 27; 552 a 12-14.

²⁹ The vinegar fly (*Oinopota cellaris*), *H.A.* 552 b 5 (cf. *G.A.* 721 a 10; *Geopon.* VI, 14, 4; Pl. IX, 160).

³⁰ *Ephemera*, Ael. II, 4; *Bibiones*, Isid. XII, 8, 16; a species of flea, Sext. Emp. *Hyp.* I, 41.

³¹ *Acari*, 'mites,' *H.A.* 557 b 7.

³² Bugs, *ib.* 556 b 27.

³³ *Ephemera*, *H.A.* 552 b 17, Pl. XI, 120. Cf. Ael. v, 43, Cic. *Tusc.* I, 39, 94.

³⁴ A winged insect, *H.A.* 552 b 10, *G.A.* 737 a 1, Pl. XI, 119, Ael. II, 2, Ov. *Fast.* VI, 292, Antig. 90, Sext. Emp. *Hyp.* I, 41.

³⁵ Pl. XI, 117.

³⁶ Pl. XI, 115; cf. XI, 117.

³⁷ *H.A.* 557 b 8.

³⁸ Isid. XII, 8, 10, cf. Pl. XI, 95.

³⁹ Schol. on Ar. *Nub.* 984; cf. Eustathius Africanus, *Bas. Hex.* IX, 2 (XXX, 959 C Migne).

⁴⁰ Ov. *Met.* xv, 368; Pl. XI, 70; Pl. ap. Serv. *ad Geor.* IV, 286; Isid. XII, 8, 2 and 4.

⁴¹ Serv. *ad Aen.* I, 435.

⁴² Pl. ap. Serv. *ad Geor.* IV, 286; Serv. *ad Aen.* I, 435; Isid. XII, 8, 2.

⁴³ Ael. I, 28; Plut. *Cleom.* 39; Nic. *Ther.* 741; Orig. *contra Cels.* IV, 57; Antig. 23; Sext. Emp. *Hyp.* I, 41; Suid. *s.v.* ἕντρος; Varro, *R.R.* III, 16, 4; Pl. XI, 70; Serv. *ad Aen.* I, 435.

⁴⁴ Pl. ap. Serv. *ad Geor.* IV, 286; Isid. XII, 8, 2.

⁴⁵ Serv. *ad Aen.* I, 435.

asses⁴⁶ or in horses;⁴⁷ scorpions in crocodiles⁴⁸ or crabs;⁴⁹ and locusts in mules.⁵⁰

In spite of the intimate acquaintance of the ancients with the bee, there was no creature whose sex history was more shrouded in mystery or gave rise to a more interesting series of speculations. They had no inkling of the nuptial flight of the queen.⁵¹ Although, as stated before (p. 102), Aristotle does notice the theory of some men that this insect originated in the natural way, he does not take it seriously. It is recorded time and again in the classical languages that bees are generated in the bodies of putrefying oxen.⁵² It is stated, in fact, that oxen were deliberately killed to provide a breeding place.⁵³ If we may believe Antigonus (23), in certain places in Egypt bulls were buried with only the horns protruding, and when the carcasses had putrefied, the horns were sawed off and bees issued from the bodies. At times we find bees represented as springing from the blood of the slain animal (Verg. *Geor.* iv, 284), or even from worms that breed in the blood (Isid. xii, 8, 2).

An elaborate, almost ritual-like method of generating bees is described in the *Geoponica* (xv, 2, 22-29). Explicit directions are given for the construction of a house to confine the bull, for the method of selecting and killing the victim, and for the treatment of the carcass. If all the requirements are complied with, the house will finally be found "full of bees,

⁴⁶ Plut. *Cleom.* 39; Pl. xi, 70; Orig. *contra Cels.* iv, 57; Sext. Emp. *Hyp.* i, 41.

⁴⁷ Isid. xii, 4, 3. ⁴⁸ Antig. 23. ⁴⁹ Isid. xii, 4, 3. ⁵⁰ *Ib.* xii, 4, 3-4.

⁵¹ See G.A. 759 b 23, and Pl. xi, 46; also Royds, *Beasts, Birds, and Bees of Virgil*, 82.

⁵² It seems superfluous to give references. Many citations can be found in Pauly-Wissowa, s.v. *Biene*, and in *Thes. Ling. Lat.*, s.v. *apis*. For a fuller list of references see W. Robert-Tornow, *De apium mellisque apud veteres significatione et symbolica et mythologica* (Berlin, 1893), 19-29. See also A. E. Shipley, "The 'Bugonia' Myth," *Journ. of Phil.* xxxiv, 97-105, and A. B. Cook, "The Bee in Greek Mythology," *J.H.S.* xv, 1-24.

⁵³ Verg. *Geor.* iv, 531-558. Cf. Ov. *Fast.* i, 376-380, Pl. xi, 70, Liban. *Bov. Laud.* viii, 273 Foerster.

hanging together in clusters, and nothing left of the ox but horns, bones, and hair." Herodotus, v, 114, tells of the hiving of bees in the head of a decapitated man, and Servius, on Verg. *Aen.* i, 430, notes that Ceres caused bees to spring from the body of an old dame named Melissa.

The origin of the notion of carcass-born bees has been satisfactorily explained as due to the confusion of the bee with a fly of bee-like aspect, the *Eristalis tenax*. This 'double' of the bee resembles it so closely in structure and habits that the similarity has confused scientists as well as the unobservant. To its habit of ovipositing and breeding in carcasses has been attributed the rise of the belief under discussion.⁵⁴ The bee is cleanly. As regards the riddle of Samson (Judg. 14, 8), "the seeing of a swarm of bee-like flies was a fact; the finding and eating the honey was the myth grown out of the misconceived fact."⁵⁵

Another common notion as to the origin of bees was that young ones were gathered from flowers,⁵⁶ a belief that was found as late as the seventeenth century.⁵⁷

In the water, too, spontaneous generation was supposed to take place. Aristotle, *H.A.* 569 a 10-27, proves to his own satisfaction that certain fish spring either from mud and sand, or from the foul matter that rises as a scum. The first class is illustrated by a species of mullet⁵⁸ (*ib.* 569 a 24) and the second by little fish called 'froth' or 'foam'⁵⁹ (*ib.* 569 a 29). These fish, called also ἀφύαι, 'not born,'⁶⁰ may originate likewise from the foam thrown up by falling rain (*ib.* 569 b 15; Pl. ix, 160), from the rain itself (Pl. xxxi, 95), or from

⁵⁴ C. R. Osten Sacken, "The so-called Bugonia of the Ancients," *Smithsonian Report*, 1893, 487-500.

⁵⁵ *Ib.* 495.

⁵⁶ *H.A.* 553 a 17-24 (cf. Verg. *Geor.* iv, 200-201); Pl. xi, 46; Col. *R.R.* ix, 2, 4; Salv. *Gub. Dei*, iv, 43.

⁵⁷ Royds, *op. cit.* 85.

⁵⁸ Cf. 'sea hare,' Ael. ii, 45.

⁵⁹ Compare the tradition that Aphrodite was 'foam-born.'

⁶⁰ Platt, commenting on *H.A.* 569 a 29, notes that young fry, especially those of the atherine or sand smelt, are called *nonnati* in the Adriatic, *nonnats* at Marseilles.

mud (Ael. II, 22). The so-called 'sea lungs' (πλεύμονες)⁶¹ are likewise spontaneously produced (H.A. 548 a 11).

The sex history of the eel caused the ancients as much perplexity as did that of the bee. Since eels spawn only in the depths of the sea, a fact that has not long been known, the ancients may be forgiven for not succeeding in solving the problem. Aristotle tells us that "the eel is neither male nor female and can engender nothing" (H.A. 538 a 2), "nor was an eel ever found supplied with either milt or spawn, nor are they when cut open found to have within them passages for spawn or for eggs" (*ib.* 570 a 16). Aristotle does not, however, content himself with negations, for he goes on to say that eels "grow spontaneously in mud and in humid ground; in fact, eels have at times been seen to emerge out of earthworms, and on other occasions have been rendered visible when the earthworms were laid open by either scraping or cutting. Such earthworms are found both in the sea and in rivers, especially where there is decayed matter; in the sea in places where seaweed abounds, and in rivers and marshes near the edge; for it is near to the water's edge that sun-heat has its chief power and produces putrefaction"⁶² (H.A. 570 a 16-23).

In Athenaeus, VII, 298 c, we are told that eels entwine themselves and discharge a sort of viscous fluid from their bodies. This, it is said, lies in the mud and generates living creatures.⁶³ Pliny, IX, 160, explains that eels scrape themselves against rocks and the particles scraped off come to life.

The puzzle about the eel interested Izaak Walton. He does mention in a casual fashion the fact that some people believed in the generation of eels by sexual union, but he quotes with more confidence the views of those who hold "that they breed (as some worms do) out of the putrefaction

⁶¹ Theophrastus, *de Sign.* 40, speaks of them as *οι πνεύμονες οι θαλάττιοι*; Pliny, XVII, 359, calls them *pulmones marini*. On lungfish, see Schmucker, *Meaning of Evolution*, 176-177.

⁶² Thompson's translation.

⁶³ Cf. Opp. *Hal.* I, 516.

of the earth, and divers other waies." Still others, he informs us, say "that Eeles are bred of a particular dew falling in the Months of May and June on the banks of some particular Ponds or Rivers (apted by Nature for that end) which in a few dayes is by the Suns heat turned into Eeles" (*The Complete Angler*, chap. 10).

It was supposed that shellfish in general grew spontaneously in mud, slime, sandy bottoms, and in matter that collected on piles, logs of wood, and the bottoms of ships. Among them are oysters,⁶⁴ cockles, barnacles, limpets, nerites (*H.A.* 547 b 17-23), hermit crabs (*ib.* 548 a 15), mussels, scallops, and the murex (*Pl.* ix, 160).

Leeches and snails originate either on land or in the water (*Pl.* ix, 162).

It is, perhaps, not strange that the theory of spontaneous generation was employed to explain the existence of the smaller creatures of the land, such as insects, and of some of the smaller inhabitants of the deep whose sex history and anatomy were unknown, but the extension of the doctrine to a number of the larger and more familiar animals does small credit to ancient powers of observation. It was believed, for instance, that a female mouse could become pregnant simply by licking salt (*H.A.* 580 b 32: cf. *Ael.* ix, 3). Pliny, x, 185, records not only this view, but also a far more general one: *Generatio eorum lambendo constare, non coitu, dicitur*. Egyptian mice have a different story, for it is said that they were created from the generative powers of the water and the earth after the waters had subsided, and that the stages of their creation might be observed (*Pl.* ix, 179). Isidore, *Orig.* xii, 3, 1, records a view that they were born from the moisture of the earth.

There was a well-established notion in antiquity that frogs were generated from mud,⁶⁵ an idea that persisted beyond the Middle Ages. We find Sir Thomas Browne writing of frogs

⁶⁴ Aristotle gives his proof for this in *G.A.* 763 a 26-34.

⁶⁵ *Ov. Met.* xv, 375; *Sext. Emp. Hyp.* i, 41. See also *Pl.* ix, 72.

that arise from putrefaction and are called *temporariae* because they soon die.⁶⁶

There was a very common popular belief that snakes came from the marrow of the human spine,⁶⁷ being formed by the melting and gathering together of its juices (Plut. *Cleom.* 39). We may imagine that it was a pious mortal who started the story that this treacherous animal originated from the spines of wicked men (Ael. I, 51). At Tiryns certain small serpents were born from the ground (Pl. VIII, 229). Serpents in Africa grew from the blood that dropped from Medusa's head as Perseus carried it over that land (Ov. *Met.* IV, 616-620).

The wind, too, plays a prominent part in popular beliefs. Pliny, XVI, 93, tells us that animals mate and begin to conceive when Favonius starts to blow. This wind he calls *genitalis spiritus mundi*, 'the fecundating spirit of the world.' In view of such a statement, we are not greatly surprised to find the notion that mares conceived merely by allowing the wind to blow upon them.⁶⁸ This belief was given a rationalistic interpretation by Justin, 44, 3, to explain the extraordinary swiftness of the horses of Lusitania. The wind might also impregnate sheep,⁶⁹ tigers,⁷⁰ vultures,⁷¹ and partridges. Partridges had as a rule to be on the leeward side of the male.⁷² At times it was sufficient merely for the hen to smell the male or to hear his voice.⁷³

⁶⁶ Sir Thomas Browne's Works, I, 289 Bohn.

⁶⁷ Ov. *Met.* xv, 375 (cf. Pl. IX, 159); Sext. Emp. *Hyp.* I, 41.

⁶⁸ Varro, *R.R.* II, I, 19; Verg. *Geor.* III, 273-275; Sil. III, 379-383; Pl. VIII, 166; VIII, 189; XVI, 93; Col. *R.R.* VI, 27, 4; Aug. *Civ. Dei*, XXI, 5. This fiction may go as far back as the mares of Erichthonius (*Il.* XX, 223), but see Leaf's note *ad loc.* Cf. also *Il.* XVI, 150.

⁶⁹ Ael. VII, 27. If copulation takes place when the north wind is blowing, males are apt to be produced; if the south wind is blowing, females (*G.A.* 766 b 34).

⁷⁰ See allusion in Claud. *Rapt. Pros.* III, 265-266; Opp. *Cyneg.* III, 353.

⁷¹ Ael. II, 46; Plut. *Mor.* 286 A-B; Arist. *de Mir. Ausc.* 835 a 1; Horapollo, *Hieroglyphica*, I, 11; Dionysius, *Ὀρνιθικά*, I, 5; Phile, *de Animalium Proprietate*, 3; Amm. XVII, 4, 4; Tzetz. *Chil.* XII, 732-734; Euseb. *Praep. Evang.* III, 12; Isid. XII, 7, 12.

⁷² *H.A.* 541 a 27; 560 b 13; Ael. XVII, 15; Antig. 87; Pl. X, 102.

⁷³ *H.A.* 541 a 27; *G.A.* 751 a 13; Varro, *R.R.* III, 11, 4; Pl. X, 102; Ath. 389 e.

The belief in the generative powers of wind had its effect even on house-planning. One of the reasons why Vitruvius, VI, 7, 1, advises not to let the library face the south or west is because the winds from these directions give birth to book-worms (*Tineae*) and nourish them. It was said that a heavy atmosphere begot τετράγναθα (Ael. XVII, 40).

Wind eggs (*hyphenemia* or *zephyria*) are formed spontaneously in birds and fowls, such as doves, hens, partridges, peacocks, geese, and χηναλώπηκες.⁷⁴ Pliny (X, 166; cf. 160) attributes such eggs to the lustful thoughts of the females or to dust.

The generative power of water, especially in the form of rain, is insisted upon time after time by the ancient writers,⁷⁵ among them Lucretius, II, 871-873:

Quippe videre licet vivos existere vermes
Stercore de taetro, putorem cum sibi nacta est
Intempestivis ex imbribus umida tellus.

It is said that the salamander never appears except after rains (Pl. X, 188). Pliny, IX, 2, explains why many animals that live in water are larger than land animals: causa evidens umoris luxuria. Heat assists generation (*H.A.* 552 a 9). A combination of heat and moisture is most favorable as we see from Lucretius, VI, 797 f.:

Multaque nunc etiam existunt animalia terris
Imbribus et calido solis concreta vapore.⁷⁶

A very curious by-product of the theory of spontaneous generation is the belief that the intercourse of animals so created produces a different species.⁷⁷ Aristotle states and illustrates this belief in *H.A.* 539 b 8-12: "But whatever

⁷⁴ *H.A.* 539 a 31; *G.A.* 730 a 4; 741 a 18; 749 a 36; 750 b 3; 751 a 10, *et passim*; Soph. frag. 477 Jebb; Ath. I, 57 c; Col. *R.R.* VI, 27, 4; Isid. XII, 7, 81; Varro, *R.R.* II, 1, 19. See also Kock, *Com. Att. Frag.* I, 435, frag. 185-186; I, 605, frag. 19; II, 216, frag. 6; III, 31, frag. 104.

⁷⁵ *E.g.*, in the case of the ἀφύη, Pl. xxxi, 95; a tiny fish, *H.A.* 569 a 13-18; eels, *ib.* 570 a 10; cicadas, Eustathius Africanus, *Bas. Hex.* IX, 2 (xxx, 595 C Migne).

⁷⁶ See also Ov. *Met.* I, 430 f., Pl. XVIII, 151.

⁷⁷ Cf. *G.A.* 715 b 2-15.

creatures are spontaneously generated, either in other animals, in the soil, or on plants, or in the parts of these, and when such are generated male and female, then from the copulation of such spontaneously generated males and females there is generated a something — a something never identical in shape with the parents,⁷⁸ but a something imperfect. For instance, the issue of copulation in lice is nits;⁷⁹ in flies,⁸⁰ grubs; in fleas, grubs egg-like in shape; and from these issues the parent-species is never reproduced, nor is any animal produced at all, but the like nondescripts only.”⁸¹ It is remarkable that this notion, now called heterogenesis or xenogenesis, was held by the first great opponent of spontaneous generation, the Italian Redi. In modern times tapeworms, bladder worms, and flukes were among the latest strongholds of the advocates of xenogenesis.⁸²

Closely related to spontaneous generation is the belief in showers of animals. The *locus classicus* on this subject is, perhaps, Athenaeus, 333 a-b. He describes an uninterrupted three days' rain of fish and a deluge of frogs that can be compared only to the plague of frogs in Egypt. On one occasion a rain of frogs took place at Naples (Ael. II, 56). On still another occasion so many frogs fell that they caused a tribe to migrate (*ib.* XVII, 41). After a hailstorm at Thebes mice were seen upon the land (*ib.* II, 56). Mice were born whenever it rained in Egypt with light drops (*ib.* VI, 41). Plutarch, *Symp.* IV, 2, 1, pokes fun at people who believe that a shower breeds snails instead of making them creep forth where they may be seen.⁸³

⁷⁸ For instance, butterflies were supposed to originate from caterpillars, *H.A.* 551 a 13 (cf. *Ath.* VIII, 352 f).

⁷⁹ Lice, fleas, and bugs produce nits, *H.A.* 556 b 22 (cf. *G.A.* 732 b 10-14, 758 b 7-28, *Pl.* x, 189-190).

⁸⁰ Cf. *G.A.* 721 a 8, 723 b 5.

⁸¹ Cf. *H.A.* 556 b, *Ath.* VIII, 352 f, *Pl.* x, 190. In the *Iliad*, XIX, 25-27. flies enter wounds and beget maggots.

⁸² See *Scientific Memoirs of Thomas Henry Huxley*, III, 577 f.

⁸³ For modern instances of rains of small toads and fishworms, see *Journ. of Am. Folk-Lore*, XXXI, 10.

When we pass beyond the pagan period, we find the Christian Fathers making use of these old beliefs to defend the tenet of the virgin birth of Christ. Lactantius, *Inst.* I, 8, 7-8, quoting Vergil, writes as follows: Quid igitur sexu opus est femineo, cum Deus, qui est omnipotens, sine usu et opera feminae possit filios procreare? Nam si minutis animalibus (*i.e.* apibus) id praestitit ut sibi *e foliis natos et suavis herbis ore legant* (*Geor.* IV, 200), cur existimet aliquis ipsum Deum, nisi ex permixtione sexus alterius, non posse generare?⁸⁴ The Fathers called attention to the supposed facts that mares conceived from the wind (*Aug. Civ. Dei*, XXI, 5) and that vultures were all females. They reminded their pagan critics that Perseus was virgin-born, that the phoenix was reborn *sine coniuge*, that Minerva sprang full-grown from the head of Zeus, Aphrodite from the sea foam, Castor and Pollux from an egg, the Myrmidons from ants, and a crop of men from the stones thrown by Deucalion and Pyrrha.⁸⁵

These old beliefs had their effect likewise on St. Augustine's notions about the animals in the ark. He says that it would have been unnecessary for Noah to preserve in the ark any creatures that were born from corruption⁸⁶ (*Civ. Dei*, xv, 27). He tells us likewise that as *muli et mulae* do not have offspring, it is not strange if they were not represented in the ark. Eustathius Africanus⁸⁷ explains the text, "Let the earth bring forth," by rehearsing at length time-honored notions of spontaneous generation.

In the age of the microscope the ancient views about the origin and perpetuation of some forms of animal life seem ridiculous, yet they were shared by the learned men of antiquity, persisted throughout the Middle Ages, and may still be found among the uninformed. Within the last two hundred years we find the belief prevailing that barnacles on ships

⁸⁴ Cf. Rufinus, *Comm. in Symb. Apost.* 74 (Migne, XXI, 350).

⁸⁵ Migne, *l.c.*

⁸⁶ After the great flood of classical tradition, all forms of life below man were restored by spontaneous generation (*Ov. Met.* I, 416-437; cf. Mela, I, 9).

⁸⁷ *Bas. Hex.* IX, 2 (xxx, 959 C Migne).

become geese when broken off, that certain shellfish growing on trees fall into the water and become brant geese or tree geese,⁸⁸ that pickerel weed and eelgrass produce pickerel and eels,⁸⁹ that the nematode worm originates from horsehairs,⁹⁰ that carcasses generate maggots, etc.

The men who finally challenged the theory of spontaneous generation were confronted with vigorous opposition from doubting scientists, who, as one demonstration after another was given of the natural origin of animal life, still affirmed the validity of the old doctrine for the next lower order. In 1668 the Italian Redi made the first attack on the theory. By the simple device of protecting meat from flies by netting, he proved that maggots do not originate spontaneously. He was inclined to believe that all visible forms of life originated from life, a fact that his successors established.

The revelation of microscopic infusorial life and the discovery of oxygen with the realization of its part in sustaining life ushered in new epochs in the investigation. Pasteur was finally dragged into the discussion about 1860, and in 1864 before a brilliant audience at the Sorbonne demonstrated that the air was the source of the organisms that were developed in infusions. Soon after, the work of the physicist, Professor John Tyndall, who used optically pure air in his tests, concluded two centuries of experimental refutation of the theory of spontaneous generation.⁹¹ After these experiments the conservatives took the only position left to them, that life arises spontaneously in ultra-microscopic particles. As late as 1912, in another presidential address before the British Association for the Advancement of Science, we find the statement that we can by no means be sure that the evolution of

⁸⁸ Brand's *Popular Antiquities*, 779.

⁸⁹ Schmucker, *op. cit.* 159-160.

⁹⁰ *Journ. of Am. Folk-Lore*, XXXI, 9.

⁹¹ For a readily accessible summary of the history of the experimentation which led to the overthrow of the hypothesis of the ancients, see John Tyndall, "Spontaneous Generation," *Pop. Sc. Monthly*, XII (1878), 476-488; 591-604. See also W. A. Locy, *Biology and its Makers*, 277-293.

non-living substance into living may not be happening still.⁹²

It is hoped that this paper will fill out for biologists the initial chapter in the history of spontaneous generation, and, at the same time, prove of permanent value to the ever increasing number of students of folklore.⁹³

⁹² Schaefer, "The Nature, Origin and Maintenance of Life," *Science*, xxxvi, 297.

⁹³ To keep the paper within reasonable limits, I have refrained from discussing the spontaneous generation of plants. Many illustrations of it can be found in Theophr. *H.P.*



An Animal Weather Bureau

Author(s): Eugene S. McCartney

Source: *The Classical Weekly*, Vol. 14, No. 12 (Jan. 17, 1921), pp. 89-93

Published by: [Classical Association of the Atlantic States](#)

Stable URL: <http://www.jstor.org/stable/4388100>

Accessed: 12/08/2013 08:58

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The Classical Weekly

Entered as second class matter November 18, 1907, at the Post Office, New York, N. Y., under the Act of Congress of March 3, 1879
Acceptance for mailing at special rate of postage provided for in section 1103, Act of October 3, 1917, authorized on June 28, 1918

VOL. XIV

NEW YORK, JANUARY 17, 1921

No. 12

AN ANIMAL WEATHER BUREAU

The loci classici for weather lore in Latin are to be found in Vergil, in the First Book of the Georgics. Since commentators have not seen fit to quote parallel passages or to comment at length upon these passages in Vergil, there seems to be need of a comparative treatment of ancient weather signs derived from animals. This article may be regarded as a sort of postscript to the work of Royds, who in his book, *The Beasts, Birds and Bees of Virgil* (Blackwell, Oxford, 1914), shows no special interest in such prognostics.

As is the case with us, the ancients found a foreknowledge of weather conditions not only convenient, but profitable. In lieu of government prognostications they consulted, among other things, the animal weather bureau. We are informed by Pliny, N. H. 8.102, that nature has bestowed upon many animals¹ the faculty of observing the heavens, and of presaging the winds, rain, and tempests.

In comparing the relative ability of men and animals in prognosticating the weather, Aelian, *De Natura Animalium* 7.8, says that in all respects man is inferior and does not know of the changes before they occur. We find even Cicero, *De Divinatione* 1.15, writing as follows: *Inest in ranunculis vis et natura quaedam significans aliquid per se, ipsa satis certa, cognitioni autem hominum obscurior*. Aelian thinks that animals do not receive enough credit for their weather knowledge. He says that it arouses no admiration when an ox, by resting on its right side, serves notice that a storm is about to break, or when, by turning over to its left side, it shows that clear weather has come again. When, however, while it is still clear, a man appears in the theater or at the games clad for bad weather, it is a cause for astonishment, and all think that he is endowed with some divine intelligence.

Dogs, oxen, pigs, goats, serpents, and other animals know when a famine is approaching, and they are the first to detect the signs of a pestilence or of an earthquake. They know in advance when conditions are going to be salubrious and when there are going to be good crops. In these things they do not err, says Aelian, 6.16. Aristophanes, *Aves* 717-719, makes the birds say that, whatever man does, he first looks to them and their flying.

To animals was attributed even the power of speech. Achilles's horse talked with his master. Democritus went so far as to give some preparations from snakes

which would enable one to understand the language of birds (Pliny, N. H. 29.72).

It is but natural to suppose that the peasantry and the seafarers are more responsible for weather lore than are city dwellers. Agricultural and fishing communities are obviously more interested in weather conditions, and, in addition, have more opportunity for making observations in the animal world. As the presence or the absence of rain and storm has a very vital relation to the welfare of such persons, one is not surprised that a considerable body of rain lore grew up.

RAIN AND STORM

Numquam inprudenter imber obfuit.

So many are the signs of storm upon both land and sea that no one with eyes and ears open need be taken unawares, as we learn from Georgics 1.373-374. In 374-389 Vergil continues as follows:

For while 'tis brewing, cranes of lofty wing
Retreat to lowland vales; the heifer scans
The sky above and snuffs the passing breeze
With nostrils wide; the swallow with shrill cry
Flits round the pond, and from the marsh ooze
The frogs in choir their age-long trouble sing;
Often the ant from out her secret cells
Bores her straight path and brings her eggs to air;
A spacious rainbow drinks the rain; the crows²
Their camp abandon and in martial line
Depart, with clashing of unnumbered wings;
Sea-birds of many a tribe, that haunt the fens
Of Asia and Caÿster's waters fair,
Eagerly splash their backs with showers of spray,
Dive head down in the stream, and race along
The rippling surface, while unrestingly
They plunge with fury in the needless bath.
With lifted voice the loud insulting crow
Invokes the rain, and o'er some sandy marge
Circles alone³.

Vergil's reference to the cranes reminds one of the cranes in *Iliad* 3.4-5, which 'flee the winter and the unspeakable storm and make for the streams of Ocean'.

If cranes fly early and in flocks, a storm is imminent; but, if they fly late and for a long time, the storm will come late. If they wheel about in their flight, they indicate stormy weather⁴ (Th. 38)⁵. Their cries, too,

²"It is surprising that an author so observant as Virgil and so intimately acquainted with the habits of animals, should distinctly use *cornix* for raven, and *corvus* for rook": Wedgwood, *Transactions of the Philological Society* (1884), 108. See Royds, 40 f.

³I use the translation by T. C. Williams (for this see *THE CLASSICAL WEEKLY* 10.183-184).

⁴Hort translates, "it will be an early winter", justifying his translation by Aratus, *De Signis* 343 f. The paragraph containing these words lists, however, only signs of storms. The present writer does not believe that Aratus supports Hort's translation. In a number of other places the writer is under obligation to Hort's careful translation of Theophrastus.

⁵The abbreviations are to be interpreted as follows: Th. =

¹Throughout this paper the word *animal* is used in the Latin sense.

summon rain (Ael. 1.44; compare Aen. 10.265). A heavy storm is brewing when they make from the sea to the land and fly in confusion (Ael. 7.7), or with loud cries search for food (Ar. 1021-1022). Aristotle, *Historia Animalium* 9.11, says that these birds fly high in order to have a wide prospect, and that, if they see clouds and storms coming, they descend and keep quiet⁶.

We are informed that it is a sign of rain when the swallow flies low and skims along the surface of the water near enough to ripple it every now and then with its wings or breast (Th. 15)⁷. The actions of the swallow are still considered a good indication of the weather, since it flies low only when hygrometric conditions prevent insects from going aloft. The swallow then descends for its prey⁸.

The raven is called by Horace, *Carm.* 3.27.10, *imbrum divina avis imminetum*.

It is a sign of rain if the raven, who is accustomed to make many different sounds, repeats one of these quickly and makes a whirring sound and shakes his wings. So too if, during a rainy season, he utters many different sounds, or if he searches for lice perched in an olive-tree. And if, whether in fair or wet weather, he imitates, as it were, with his voice falling drops, it is a sign of rain⁹.

It means the same thing when the raven flies high and screams like a hawk, or if, in fair weather, he does not utter his accustomed note (Th. 16); also when he calls late (Th. 39; compare Plutarch, *Moralia* 129 A). One can look for rain if ravens appear in flocks and shriek like hawks, or if they caw twice very loudly and flap their thick-feathered wings (Ar. 963-969). When the raven utters a great variety of sounds in winter, it is a herald of storm (Th. 40)¹⁰.

The *cornix*, or crow proper¹¹, predicts storm by cawing twice and then a third time, as well as by cawing late in the day (Th. 39; compare Ael. 7.7), or at night (Ar.

1022-1023). By descending with cries to the water and sprinkling itself, it may indicate the same thing (Pl. 18.363). One of this bird's epithets is *ὕεθραυρις*, 'rain-seer' (Euphorion, *Frag.* 65). Horace's *aquae augur* (*Carm.* 3.17.13) seems like a literary echo. At times the cry of both raven and crow may mean wind as well as rain (Lucretius 5.1083-1086)¹²:

Et partim mutant cum tempestatibus una
raucisonos cantus, cornicum ut saccla vetusta
corvorumque greges, ubi aquam dicuntur et imbris
poscere et interdum ventos aurasque vocare¹³.

Theophrastus makes several statements about the finch. When it sings at dawn, it indicates storm or rain (Th. 23; compare Ar. 1023), but in the afternoon, rain (23). Singing in an inhabited dwelling, it preludes a storm (40). When a finch kept in a dwelling cries at dawn, it portends either a rain or a storm (19)¹⁴. The sparrow as well as the finch indicates storm by chirping at dawn (39).

Jackdaws have a great deal to say about the weather. They indicate a storm when they fly from the south (Th. 40), or when they cry late in the day (Th. 39; compare Ar. 1023). It means rain when they fly upwards and scream like hawks (Th. 16); when they appear in flocks and scream like hawks (Ar. 965-966); when they flap their wings under the eaves of a house (Ar. 970-971); when they cry late in the evening (Ael. 7.7); or when, as is the case with cocks, they shake out their wings over a pond or the sea in the manner of a duck (Th. 18). Storms are portended when they return late from their feeding (Pl. 18.363), or when they leave their feeding to return to their roosts (Ar. 1026-1027). When they fly, sometimes high, sometimes low, and scream like a hawk, it is an omen of frost as well as of rain (Ael. 7.7). Ovid, *Amores* 2.6.34, speaks of the jackdaw as *pluviae graculus auctor aquae*.

Rain will follow when a hawk perched on a tree flies farther within it and picks lice from itself (Th. 17)¹⁵, or

Theophrastus, *De Signis*; Ar. = *Aratus*, *Phaenomena*, to the end of which is generally added his *De Signis*; Ael. = *Aelianus*, *De Natura Animalium*; Pl. = *Plinius*, *Naturalis Historia*. I have not deemed it worth while to encumber this article by frequent reference to *Avienus's* translation of the *De Signis* of *Aratus*, or to the *Geoponica*. Thompson = *D'Arcy Wentworth Thompson*, *A Glossary of Greek Birds*. I am much indebted to this wonderful collection of material. I am indebted to a smaller degree to the delightful book by Professor E. W. Martin, *The Birds of the Latin Poets* (see *THE CLASSICAL WEEKLY* 10.143-144). Abbott = C. A. Abbott, *Animal Weather Lore in America*, *Popular Science Monthly* 28.635-643; Dunwoody = H. A. C. Dunwoody, *Weather Proverbs*, *Signal Service Notes*, No. IX; Dyer = Dyer, *English Folk-Lore*² (1880); Fogel = E. M. Fogel, *Beliefs and Superstitions of the Pennsylvania Germans*, *Americana Germanica* 18. 221-241; Inwards = R. Inwards, *Weather Lore*; Owen = E. Owen, *Welsh Folk-Lore* (1896).

⁶"When the crane flies against the stream, she asks for rain; when with the stream, she asks for fair weather": Owen, 321.—"If a crane flies southeast, a rainstorm is near; if northwest, fine weather": *Journal of American Folk-Lore* 31.8.

⁷Compare Ar. 944-945; Pl. 18.363; Varro *Atacinus ap. Servium* in *Georgica* 1.375.

⁸For the same reason, presumably, fish jumping out of the water are supposed to give warning of storm. See Dunwoody, 50.

⁹Th. 16, as translated by Hort. See Ar. 966-967, and compare 'The raven wishes to imitate drops of rain' (Ael. 6.19).

¹⁰Compare also Ael. 7.7; Nicander, *Theriaca* 406, and the scholiast there; Pl. 18.362; Dracontius, *Laudes Dei* 1.527.

¹¹I translate *cornix* by 'crow' and *corvus* by 'raven', without presuming to straighten out the ancient tangle.

¹²For other references to the crow, see *Thesaurus Linguae Latinae*, s. v. *cornix*, B. 2.

¹³"Ravens and crows, when they do make a hoarse, hollow and sorrowful noise, as if they sobbed, it presages foul weather approaching. Crows flocking together in great companies or calling early in the morning with a full and clear voice, or at any time of the day gaping against the sun, foreshews hot and dry weather: but if at the brink of ponds they do wet their heads, or stalk into the water, or cry much towards the evening, are signs of rain": *Willsford's Nature Secrets*, 133.—"When it <the crow> makes a hoarse hollow noise, it presages foul weather": Dyer, 81.—In Devonshire lore, when crows fly low, it is a sign of rain. When rooks or crows stay at home or return early in the day, rain should be expected; if they fly far away, it will be fair. In Greece, too, ravens bring the summer rain. See Walker, *Bird Legend and Lore*, 223, 226.—Compare also Hosmer's verses:

Warned is the reaper of foul weather nigh,
When the prophetic creature, in its flight,
With changed note in its discordant cry,
Moves like a gliding kite,
While louder grows that wild presaging call,
Sheaves are piled high upon the harvest wain,
And the stack neatly rounded ere the fall
Of hail and driving rain.

¹⁴"In Scotland and the north of England, the plaintive note of the chaffinch . . . is interpreted as a sign of rain. When, therefore, the boys hear it, they first imitate it, and then rhymingly refer to the expected consequences:—"Weet; Weet!—Dreep, dreep!"": Dyer, 86.

¹⁵Compare Abbott, 206:

The hen-hawk's scream at hot high noon
Foretells a coming shower soon.

when the robin and the wren seek shelter (Th. 39)¹⁶. If in winter sparrows begin to be clamorous at evening, it is a sign of a change of wind or of rain (Th. 28). If the kite flies continually, the shepherd should take with him some protection against the rain (Varro ap. Nonium 179.1)¹⁷. Storms will follow the hooting of the owl in clear weather (Ael. 7.7), or the cry of a solitary *δολυγών*¹⁸ at early dawn (Th. 42; Ar. 948). Servius in Georgica 1.401 makes significant the hooting of the owl after sunset. So too in contemporary weather lore the owl's cry at night betokens a change of weather¹⁹.

The cuckoo's reputation as a rain-seer was already well established in the time of Hesiod (Opera et Dies 486-490)²⁰. Miss Jane Harrison would date the weather knowledge of the cuckoo as far back as Minoan times, for she identifies as a cuckoo the bird on the well-known sarcophagus from Hagia Triada (see Themis, 177) and says (179) that it "is summoned to bring new life to the tree, dead in the winter, to bring the rain that will bring the food-fruits".

The woodpecker, too, was a *pluvia avis*²¹. As a rain-maker it has been discussed rather fully by Rendel Harris, Picus Who Is also Zeus, 37-47.

The appearance of a white sparrow or swallow or of a white bird of any species that is usually black is a prelude to a storm, just as black ones in great numbers indicate rain (Th. 39). It is a rain sign when large numbers of white birds make their appearance (Ael. 7.7). There is a species of 'white birds' which give notice of stormy weather when they descend to the water and besprinkle themselves (Pl. 18.363). If 'white birds' come near to farms, they portend showers or storm (Th. 47).

¹⁶Compare Ar. 1025-1026; Ael. 7.7.

¹⁷"Kites flying unusually high are said to indicate fair weather": Dunwoody, 37.

¹⁸The scholiast on Aratus 948 says that this is a bird, but that it is sometimes taken as a tree-frog. See note 53.

¹⁹Walker, Bird Legend and Lore, 205. Among the Pennsylvania Germans, "If owls hoot from the hills, it indicates clear weather; if from pine trees, disagreeable weather": Fogel, 224.—"If owls hoot at night-fall or after daybreak, it indicates bad weather": Fogel, 225.—"The hooting of owls at dusk indicates rain": Fogel, 225.

²⁰Compare the last two stanzas of a four-stanza poem on The Rain-Crow, by Madison Cawein (Stedman, An American Anthology, pp. 708-709):

But thou art right. Thou prophesiest true.
For hardly hast thou ceased thy forecasting.
When, up the western fierceness of scorched blue,
Great water-carrier winds their buckets bring
Brimming with freshness. How their dippers ring
And flash and rumble! lavishing dark dew
On corn and forestland, that, streaming wet,
Their hilly backs against the downpour set
Like giants vague in view.

The butterfly, safe under leaf and flower,
Has found a roof, knowing how true thou art;
The bumble-bee, within the last half-hour,
Has ceased to hug the honey to his heart;
While in the barnyard, under shed and cart,
Brood-hens have housed. But I, who scorned thy power,
Barometer of the birds,—like August there,—
Beneath a beech, dripping from foot to hair,
Like some drenched truant, cower.

²¹"The woodpecker, from its vociferous cry when rain is impending, has been popularly called 'the rain-bird'; and in many country districts it is held in no small estimation from its prognosticating wet; and Wallis, in his History of Northumberland, tells us that it is called in that country by the common people 'rain-fowl'. Both these terms are analogous to the *pluviae aves* of the Romans, who for the same reason gave them this designation": Dyer, 90. I have been unable to run down the ancient source for the statement about the *pluviae aves*.

Bad weather will follow when birds that dwell in trees hide themselves in their nests (Pl. 18.363); when birds which are not aquatic wash themselves (Th. 15); or when, during the summer, birds that live on islands appear in flocks *on the mainland*²² (Th. 17; compare Ar. 981-982).

Marsh and sea birds anticipate changes as readily as do land birds. The heron crying early in the morning indicates either rain or wind, but, if it cries as it makes for the sea, it is an indication of rain rather than of wind (Th. 18). In general a loud cry means wind (Th. 18)²³. Several writers state that, on the approach of a storm, the heron seeks the upper regions of the air²⁴, but Pliny (18.363) says that it stands melancholy on the sands. Aelian (7.7) tells us that there will be a storm when the heron cries early in the morning; when it sets out straight to the sea, there will be rain²⁵.

Similar to Vergil's lines on the *cornix* (Georgics 1.388-389) is a passage in Claudianus, De Bello Gildonico 492-493: *Heu nimium segnes, cauta qui mente notatis, si revolant mergi, graditur si litore cornix*. Apropos of such statements Thompson, A Glossary of Greek Birds, 100, writes: "It is at least pretty clear that in such passages the Latin poets were thinking more of what they had read than of what they had seen". He thinks that the Romans imitate Greek descriptions of the *κορώνη ἢ θαλάσσιος*. He suggests 'cormorant' for this bird, but more recently has identified it as the little shearwater²⁶.

It is a sign of rain when this bird puts back its head on a rock which is washed by waves, or when it dives or hovers over the water (Th. 16; compare Geoponica 1.3.6). Aratus (949-953) tells how the *κορώνη*, when a storm is approaching, seeks refuge on a headland along the coast, or somewhere along a river dips its head, or even its whole body, in the water, or walks along the water's edge shrieking loudly²⁷. The cry of the 'sea-owl' during fine weather is a sign of storm (Th. 52).

One may include under Vergil's water birds wild ducks and *αἰθυαί*²⁸. When they are seen flapping their wings on land, rain is looked for (Th. 28; compare Ar. 918-919)²⁹. Birds are not unaware of an approaching

²²That this is the meaning is proved by Ar. 1094-1100.

²³Compare Ar. 972; Cicero, De Divinatione 1.14. Cicero here translates the *ἐρῶδιος* of Aratus by *fulix*.

²⁴Lucan, Pharsalia 5.554-555; Seneca, Naturales Quaestiones 7.28.11; Isidorus, Origines 12.7.21.

²⁵When he <the great heron> leaves the seacoast, and traces on wing the courses of the creeks or rivers upwards, he is said to prognosticate rain; when downwards, dry weather": Alexander Wilson, The Foresters.—"The heron as it flies towards the source of a river is said to be going up the river to bring the water down, in other words, it is a sign of coming rain": Owen, 323 (Welsh lore).

²⁶The Classical Review 32.96.

²⁷Compare Lucan, Pharsalia 5. 556.

²⁸In his Glossary, Thompson suggests 'gull' as the identification of this bird, but see his note in The Classical Review 32.95.

²⁹Compare Dyer, 100: "'When they <sea-gulls> appear in the fields, a storm from the southeast generally follows: and when the storm begins to abate, they fly back to the shore'. They are sometimes called 'sea-mews', and it is said that early in the morning, when they make a gagging more than ordinary, they prognosticate stormy weather. In Scotland the following rhyme is prevalent:

'Sea-gull, sea-gull, sit on the sand,
It's never good weather when you're on the land'."

"It is believed that when sea-gulls leave the sea for the mountains, it is a sign of stormy weather": Owen, 329 (Welsh lore).—"When ducks sportively chase each other through the water, and flap their

storm if they gather about marshes or the banks of rivers (Ael. 7.7); or if they fight for their food more than usual (Th. 41).

When sea or marsh birds plunge violently into the water, they are taking their final dip prior to the advent of a storm (Ar. 942-943; Cicero, *De Divinatione* 1.14)³⁰. Divers make for the land in anticipation of a storm (Lucan, *Pharsalia* 5.553; compare Callimachus, *Frag.* 167). It is in general an indication of storm when birds flee the sea (Th. 40; Ar. 1024-1025; Ael. 7.7).

Insects, too, are susceptible to weather conditions. 'It is a sign of rain if ants in a hollow place carry their eggs up from an ant-hill to the high ground; a sign of fair weather if they carry them down' (Th. 22)³¹. Vergil's *extulit ova* repeats the faulty observations of the Greeks, since it is pupae or chrysalises that the ant transports, and she carries them in rather than out. Apropos of Vergil's statement, Burroughs, *Signs and Seasons*, 7, makes the following comment:

I am told that one of the most reliable weather signs they have down in Texas is afforded by the ants. The ants bring their eggs up out of the underground retreats and expose them to the warmth of the sun to be hatched. When they are seen carrying them in again in great haste, though there be not a cloud in the sky, your walk or your drive must be postponed; a storm is at hand.

Apparently the ancient notion was that the ants carried out the 'eggs' to save them from the inundation of underground passages³².

We are told by Aristotle, *Historia Animalium* 9.27.25, that bees discern the approach of cold weather and of rain. Proof of this is the fact that they will not leave the vicinity of the hive³³, but, even if the day is apparently clear, keep busy around it. By this bee-keepers know when severe weather is expected. Such statements are frequently made³⁴. It is a sign of showers and great storms when there are many wasps in the autumn (Th. 47; compare Ar. 1064-1067).

According to a common saying, when flies bite vigorously, it is a sign of rain (Th. 23; Ar. 973-975)³⁵. The same thing is indicated when many millipeds are seen crawling up a wall (Th. 19; compare Ar. 957-958). Spiders do not spin on a clear day; hence a great number of cobwebs is a sure sign of showery weather (Pl. 11.84; compare Ar. 1033). Most people who believe in

spider signs to-day leave their umbrellas at home when they see cobwebs in profusion³⁶.

Many of the farm animals are weather wise. Vergil mentions the *bucula*. In addition to sniffing with nose to the sky and lowing³⁷, oxen indicate rain by licking themselves the wrong way³⁸ (Pl. 18.364; Ael. 7.8); and either rain or storm by licking their forefeet (Th. 15; Ar. 1114-1115). A rain storm is going to follow when with much lowing oxen reluctantly leave their pasture (Ar. 1118-1121); when they tear up the ground in late summer (Ar. 1082-1087); when a team of them is friskier than usual and lows and kicks up the dust (Ael. 7.8); when they eat more than usual or lie on their right side³⁹ (Ar. 1116; Ael. 7.8; Th. 54). Theophrastus (41) makes the last statement broad enough to include cattle in general.

It is an omen of storm when sheep skip and frisk in gambols⁴⁰ (Ar. 1104-1112; Pl. 18.364); when they tear up the ground with their feet (Ael. 7.8; compare Ar. 1082-1087); or fight for their food more than usual (Th. 41)^{40a}. Before a storm swine tear to pieces trusses of hay put out for other animals⁴¹ (Pl. 18.364) and roll about in the mud (Ar. 1123; Plutarch, *Moralia* 129 A). When pigs appear in ploughed fields, it is a signal to seek cover (Ael. 7.8). In Libya goats reveal their anticipation of

³⁶Not all people agree, however, as to what large numbers of cobwebs mean. "When you see the ground covered with spider webs which are wet with dew, and there is no dew on the ground, it is a sign of rain before night, for the spiders are putting up umbrellas; but others say when the spiders put out their sunshades, it will be a very hot day": Dunwoody, 58.

Inwards, 147, says: "Before rain or wind spiders fix their frame-lines unusually short. If they make them very long, the weather will usually be fine for fourteen days"; "If the spiders are totally indolent, rain generally soon follows"; "Spiders, when they are seen crawling on the walls more than usually, indicate that rain will probably ensue. This prognostic seldom fails, particularly in winter"; "If spiders break off and renew their webs, the weather will be wet".

³⁷See Ar. 954-955; Cicero, *De Divinatione* 1.13; Varro *Atacinus ap. Servium in Georgica* 1.375.

³⁸The same belief obtains to-day. My uncle informs me that cows lick themselves against the hair in order that the coming rain may wash the dirt out.

³⁹"When cows bellow in the evening, expect snow that night". "There are other sayings about cows—such as, if they stop and shake their feet, or refuse to go to pasture in the morning, or when they low and gaze at the sky, or lick their forefeet, or lie on the right side, or rub themselves against posts, or lie down early in the day, it indicates rain to come": Inwards, 128. See also Abbott, 630:

When a cow tries to scratch its ear,
It means a shower is very near;
When it thumps its ribs with its tail,
Look out for thunder, lightning, hail.

⁴⁰In this case the severity of the storm is commensurate with the vigor of their action.

^{40a}"Welsh sheep become infallible prognosticators of a change of weather; for by a never failing instinct, they leave the high and bare mountain ridges for sheltered nooks, and crowd together when they detect the approach of storm": Owen, 308.

Compare a story told by E. T. Seton, *Wild Animals I Have Known*, 280: "The journey through Northumberland was uneventful. At the river Tyne the sheep were driven on to the ferry and landed safely in smoky South Shields. The great factory chimneys were just starting up for the day and belching out fog-banks and thunder-rollers of opaque leaden smoke that darkened the air and hung low like a storm cloud over the streets. The sheep thought that they recognized the fuming dun of an unusually heavy cheviot storm. They became alarmed and in spite of their keepers stampeded through the town in 374 different directions".

⁴¹In Ireland, to see pigs running about the farmyard with straws in their mouth, foretells an approaching storm": Dyer, 116.—"If hogs run about with pieces of wood in their mouths, it foretells a storm": Fogel, 235 (Pennsylvania German lore).—"Hogs crying and running unquietly up and down with hay or litter in their mouths foreshadow a storm to be near at hand": "When pigs carry straw to their sties, bad weather may be expected": Inwards, 130.

wings and dive about in evident enjoyment of their pastime, it is a sign that rain is not far off": Owen, 321.

³⁰Compare also Seneca, *Naturales Quaestiones* 7.28.1.

³¹Compare Ar. 954-955; Plutarch, *Moralia* 967 F; Pl. 18.364; Varro *Atacinus ap. Servium in Georgica* 1.375.

³²Perhaps then, there is no inconsistency. It will be noted that Theophrastus speaks of 'ants in a hollow place'. Ants so improvident as to make nests in exposed positions might well carry out eggs and food prior to the inundation of their homes. Compare "When ants are situated in low ground, their migration may be taken as an indication of approaching heavy rains": Dunwoody, 55.

³³This does not agree with Burroughs's observations, which will be quoted later.

³⁴Ael. 1.11; Pl. 11.26. Compare also Ael. 5.13; Th. 46; Pl. 18.364.

³⁵Compare Dunwoody, 56: "When flies bite greedily, expect rain"; "When flies congregate in swarms, rain follows soon";

"A fly on your nose you slap and it goes;

If it comes back again, it will bring a good rain".

"If flies cling much to the ceilings, or disappear, rain may be expected": Inwards, 148. The flea, too, when greedy for blood, points to rain. See Inwards, 148.

rain by running from the stables, eagerly devouring pasture, and returning to the stables to be tended by the herdsman, or by huddling together⁴² (Ael. 7. 8)⁴³. Prior to a storm they browse eagerly on the twigs of the ilex tree (Ar. 1122-1123). An ass shaking its ears indicates storm (Th. 41)⁴⁴. So does a bitch scratching up the ground with its paws (Th. 42; Ar. 1135-1136)⁴⁵.

It is a portent of storm when cocks and other domestic fowls utter their cries in a low tone (Ael. 7.7)⁴⁶; when cocks and hens pick lice from themselves and when they make a noise like that of falling rain (Th. 17; compare Ar. 960-961). The cock does not crow when the air is already heavily saturated with moisture (Ael. 3.38)⁴⁷.

It is a sign of heavy storm when geese fall upon their food with much cackling, or fight for it (Th. 39)⁴⁸; or when they set up a continuous cackling at an unusual time (Pl. 18.363). If a tame duck under the eaves shakes out its wings, it indicates rain (Th. 18; Ar. 970-971); likewise if, in the manner of a duck, jackdaws and cocks shake out their wings over a pond or the sea (Th. 18). Divers and ducks, both wild and tame, proclaim rain by diving (Th. 28).

If weasels and mice squeak softly, there will be a heavy storm (Ael. 7.8). Prior to a storm mice dance about as well as squeak (Th. 41; Ar. 1132-1134, 1139-

1141); they also fight for chaff and carry it away, as it is everywhere commonly reported (Th. 49).

If the lizard known as the salamander is seen, it means rain (Th. 15). The appearance of many earthworms indicates a storm (Th. 42; Ar. 958-959; Pl. 18.364)⁴⁹. If a lone wolf howls near farms, there will be a storm within three days (Th. 46; Ar. 1124-1128). When wild animals approach a farm, it is in general a sign of northerly winds and a violent storm (Th. 47).

The frog croaking more than usual is a harbinger of rain (Ael. 9.13)⁵⁰. Cicero (Ad Att. 15.16b) writes in playful vein: *pluvias metuo, ranae enim propheteuunt*. In the Greek Anthology the frog is called *ὄγρος δοιδός*⁵¹. Plutarch, *Naturales Quaestiones*, 2, ad finem, says that rain water is sweeter and milder than ordinary water, and that in expectation of it frogs raise their voice as if they are calling for rain to sweeten the marsh and to be sauce for water in the pools⁵². The toad washing and frog croaking more than usual betoken rain, and so, too, does the green-frog croaking in a tree (Th. 15). When a (tree-) frog⁵³ croaks by itself at daybreak, it is a sign of storm (Th. 42).

(To be concluded)

NORTHWESTERN UNIVERSITY, EVANSTON, ILLINOIS. EUGENE S. MCCARTNEY.

REVIEW

Seneca. By Francis Holland. London and New York: Longmans, Green and Co. (1920). Pp. vii + 205.

This book is an account of the life of Lucius Annaeus Seneca, chronologically told, with a final chapter on Seneca's philosophy and its human appeal. It was originally intended to serve as an introduction to a translation of the Letters of Seneca which Mr. Holland has largely completed, but will not publish—a decision which we must regret. There is also appended an essay of fifteen pages on Maecenas, published previously in the Dublin Review, of which the *raison d'être* is the opinion of Seneca regarding the life and the style of Augustus's prime minister, and a certain parallel between their relationship and that of Seneca with the imperial court. The latter also contains a happy

⁴²"The goat will utter her peculiar cry before rain"—"Goats leave the high grounds and seek shelter before a storm" (Scotland). "If goats and sheep quit their pastures with reluctance, it will rain the next day".—"If old sheep turn their backs toward the wind, and remain so for some time, wet and windy weather is coming": Inwards, 120.

⁴³When sheep, pigs, and goats go eagerly to the male, there will be a storm (Ar. 1068-1074).

⁴⁴"If asses hang their ears downward and forward, and rub against walls, rain is approaching". "If asses bray more frequently than usual, it foreshadows rain": Inwards, 127. The reaction of horses may be more significant. "Black, lumpy clouds came up from the far-off sea; the dust went whirling in little eddies, and when the sun went down, it was of a sickly yellowish. The horses were uneasy, snorting softly, and pricking their ears in a nervous way": E. T. Seton, *Wild Animals at Home*, 102.

⁴⁵"The unusual howling of dogs portends a rain". "Dogs making holes in the ground, howling when any one goes out, eating grass in the morning, or refusing meat, are said to indicate coming rain". "If dogs roll on the ground and scratch, or become drowsy and stupid, it is a sign of rain": Inwards, 126.

Brewer, *Dictionary of Phrase and Fable*, s. v. Rain, explains what is meant by a rain of cats and dogs: "In northern mythology the cat is supposed to have great influence on the weather, and English sailors still say, 'The cat has a gale of wind in her tail', when she is unusually frisky. Witches that rode upon the storms were said to assume the form of cats; and the stormy northwest wind is called the *cat's-nose* at the present day. The dog is a signal of wind, like the wolf, both which animals were attendants of Odin, the storm-god. In old German pictures the wind is figured as the head of a dog or wolf, from which blasts issue. The *cat* therefore symbolises the down-pouring rain, and the *dog* the strong gusts of wind which accompany a rain-storm; and a 'rain of cats and dogs' is a heavy rain with wind".

⁴⁶Compare Ar. 960; Plutarch, *Moralia* 120 A; *Geoponica* 1.3.8.

⁴⁷"If the cock crows on going to bed, He's sure to rise with a watery head".

"In the midland counties <of England> it is said that

If the cock moults before the hen,
We shall have the weather thick and thin;
If the hen moults before the cock,
We shall have weather as hard as a block'.

In Derbyshire, the peasants believe that 'if the hens gather on a rising ground, and trim their feathers, it is a sure sign of rain'. And 'if the cock stays on the roost longer in the morning than usual, and crows there, it is a sign of wet': Dyer, 92-93.—"When they <fowls> look towards the sky, or roost in the daytime, expect rain; but if they dress their feathers during a storm, it is about to cease; while their standing on one leg is considered a sign of cold weather. When fowls collect together, and pick or straighten their feathers, expect a change": Inwards, 133.—If a rooster crows standing on a fence or high place, it is going to be clear.

⁴⁸Compare Ar. 1021; *Geoponica* 1.3.9.

⁴⁹The notion that worms creeping out of the ground indicate rain is still found in the United States. "Worms come forth more abundantly before rain, as do snails, slugs, and almost all limaceous reptiles": Dunwoody, 58.

⁵⁰"Frogs croak more noisily, and come abroad in the evening in large numbers, before rain". "When frogs warble, they herald rain" (Zuni Indians). "The louder the frogs, the more's the rain". "The color of a frog changing from yellow to reddish indicates rain". "Tree frogs piping during rain, indicates continued rain": Dunwoody, 72.

⁵¹Mr. Strohm informs me that it was common to see in Germany and Switzerland a small green frog kept in a glass vessel half full of water, with a set of wooden steps leading down into the water; and the weather was supposed to be indicated by the position of the frog. If he remained in the water, fine weather was expected; if he emerged and sat upon the steps, rain and cold were indicated": Inwards, 145.

⁵²*Anthologia Graeca* 1.43.

⁵³Pliny, 18.190, tells of certain plants, which, though growing in fountains, receive their nutriment only from the rains.

The identification of the *ὄγρος* has puzzled both ancient and modern scholars. See above, note 18. S. G. Oliphant, 'Ἡ ὄγρος—What was it?', *Transactions of the American Philological Association* 47.85-106, decides in favor of the frog.



An Animal Weather Bureau (Concluded)

Author(s): Eugene S. McCartney

Source: *The Classical Weekly*, Vol. 14, No. 13 (Jan. 24, 1921), pp. 97-100

Published by: [Classical Association of the Atlantic States](#)

Stable URL: <http://www.jstor.org/stable/4388107>

Accessed: 12/08/2013 08:59

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The Classical Weekly

Entered as second class matter November 18, 1907, at the Post Office, New York, N. Y., under the Act of Congress of March 3, 1879
Acceptance for mailing at special rate of postage provided for in section 1103, Act of October 3, 1917, authorized on June 28, 1918

VOL. XIV

NEW YORK, JANUARY 24, 1921

No. 13

AN ANIMAL WEATHER BUREAU

(Concluded from page 93)

Not less weather-shrewd than birds and land animals are the inhabitants of the deep. It is said that sea-urchins foreknow the approach of a storm at sea, and that they cover themselves with little stones (the precursors of anti-rolling tanks), for they are unwilling to wear away their prickles by rolling along. As soon as sea-faring folk observe their action, they at once moor their ship with several anchors⁵⁴ (Pl. 9.100)⁵⁵. When these animals fasten themselves in the sand or burrow in it, they are preparing for storm (Pl. 18.361). Shell-fish adhere to objects for similar protection (Pl. 18.361).

Plutarch, *Naturales Quaestiones* 18, asks why the sight of a cuttle-fish is a sign of a great storm.

Is it because all fishes of the soft kind cannot endure cold, by reason of their nakedness and tenderness? For they are covered neither with shell, skin, or scale, though within they have hard or bony parts. Hence the Greeks call them 'soft fish'. Therefore they easily perceive a storm coming, since they are so soon affected by the cold. When the polypus gets to shore and embraces the rocks, it is a sign that the wind is rising; but the cuttle-fish jumps up to shun the cold and the trouble of the bottom of the sea; for, of all the soft fishes, she is the softest and the soonest hurt⁵⁶.

When the cuttle-fish springs out of the water, it means a storm (Pl. 18.361, 32.15; Cicero, *De Divinatione* 2.145)⁵⁷. If *pulmones* ('sea-lungs') are seen floating on the surface, they are a sign of stormy weather for many days to come (Pl. 18.359; compare Th. 40). A dolphin frequently diving and coming to the surface near the shore indicates rain or storm (Th. 19)⁵⁸. Compare Dante, *Inferno*, Canto XXII, 19-21:

Come i delfini, quando fanno segno
Ai marinai con l'arco della schiena
Che s' argomentin di campar lor legno.

Theophrastus (40) says: 'All the signs which indicate rain bring stormy weather, that is to say, snow and storm, if not rain'. He evidently means the signs

⁵⁴Compare Inwards, 142: "The cod is said to take in ballast before a storm. It is said by Sergeant McGillivray, Signal Corps, U. S. A., that there is one well-authenticated instance of this saying. A number of cod were taken twelve hours before a severe gale, and it was found that each had swallowed a number of small stones, some of the stones weighing three or four ounces".

⁵⁵Cockles and most shell fish are observed against a tempest to have gravel sticking hard unto their shells, as a providence of nature to stay or poise themselves, and to help to weigh them down, if raised from the bottom by surges": Dunwoody, 49.

⁵⁶Compare Plutarch, *Moralia* 979 B; Oppianus, *Halieutica* 2.225.

⁵⁷Goodwin's translation.

⁵⁸Compare Lucan, *Pharsalia* 5.552.

⁵⁹"Cat-fish jump out of the water before rain": Dunwoody, 49.

that he himself mentions, but the statement would doubtless apply to all other signs of rain.

A Dr. Jenner has made an interesting collection of weather indications in a composition that reminds one of Aratus. I quote it in abridged form:

Signs of Foul Weather

The soot falls down, the spaniels sleep.
And spiders from their cobwebs peep. . . .
Loud quack the ducks, the sea fowl cry. . . .
How restless are the snorting swine!
The busy flies disturb the kine.
Low o'er the grass the swallow wings,
The cricket, too, how sharp he sings!
Puss on the hearth, with velvet paws,
Sits wiping o'er her whiskered jaws. . . .
Through the clear stream the fishes rise,
And nimbly catch the incautious flies.
The glow worms num'rous, clear and bright,
Illum'd the dewy hill last night.
At dusk the squalid toad was seen,
Like quadruped stalk o'er the green. . . .
The frog has changed his yellow vest,
And in a russet coat is drest. . . .
The mellow blackbird's voice is shrill.
The dog, so alter'd in his taste,
Quits mutton-bones, on grass to feast.
Behold the rooks, how odd their flight,
They imitate the gliding kite,
And seem precipitate to fall,
As if they felt the piercing ball.
The tender colts on back do lie,
Nor heed the traveller passing by. . . .
'Twill surely rain, we see't with sorrow,
No working in the fields tomorrow⁵⁹.

WINDS AND RAINY WINDS

Atque haec ut certis possemus discernere signis
aestusque pluviasque et agentes frigora ventos. . . .

In this manner we find Vergil, *Georgics* 1.351-352, introducing his list of signs for winds. The signs described by Vergil in *Georgics* 1.360-364 would be noted by seamen as well as by peasants. I quote Williams's translation:

Now the smiting seas
Scarce spare the ship's round side; the sea-gulls wing
From mid-sea swiftly home and fill the shore
With clamorous voice; while safe upon the beach
The brown coots play; the heron makes escape
From green salt fens, her haunt, and cloudward soars.

The alert mariner has ample warning of the approach of winds. Divers and ducks, when they clean their feathers with their bills, announce high winds. This is also the case when aquatic birds unite in flocks, when cranes make for the interior, and when divers or sea-mews forsake the sea or the creeks (Pl. 18.362;

⁵⁹Chambers's Book of Days, 1. 367.

compare Lucan 5.553). The flapping of the wings by *alθvua* (gulls?: see above, note 28) and ducks means wind⁶⁰ (Th. 28)⁶¹.

When sailors see cranes wheel about and fly in the opposite direction, they return to port (Ael. 7.14; compare 7.7). The flying of the *kepphos* (an unknown water bird) during a calm heralds wind (Th. 28). Even the direction from which a wind is to come may be ascertained, for, when it is clear, this bird flies in flocks opposite to the direction of the approaching wind (Ar. 916-917). Not less serviceable is the heron, since it places its head on its breast in the direction from which the most violent wind may be expected⁶² (Dionysius, *De Avibus* 2.8). It is a sign of wind when the heron flies aloft from the sea (Lucan 5.549-555) and screams (Th. 28; Ar. 913-914). Its cry early in the morning indicates either wind or rain (Th. 18), but a loud cry generally signifies wind (Th. 28).

By noting the actions of land birds and animals, the farmer could readily find indications of approaching wind-storms, which were destructive to vineyards. Sparrows chattering after evening has set in portend either a change of wind or showers (Th. 28). Ravens when they croak with a sort of gurgling noise give warning of the advent of wind, provided their note is continuous (Pl. 18.362). When quail are flying freely in the winter, one may know that the wind is from the north. The south wind is so heavy that it makes it difficult for them to fly. For this reason hunters 'pursue them when the wind is in the south, but not in fine weather'^{63a}. When birds bathe, it means winds and squalls (Ael. 7.7). Bees, too, detect the approach of wind (Ael. 5.13).

Hedgehogs are extremely weather-wise. When they conceal themselves in their holes, they afford a sure sign that the wind is about to change from northeast to south (Pl. 8.133). Theophrastus (30) says that the entrances to their burrows face north and south, and that they close the entrance toward which the wind is blowing. If they close both entrances, there will be a violent wind. Aristotle, *Historia Animalium* 9.7.5, attributes great powers to these animals. When the north and south winds change, those that dwell in the earth alter the position of the entrance to their burrows; those which are kept in houses change their position from wall to wall. They say that in Byzantium there lived a man who obtained the reputation of weather-seer from predictions made on observations of a hedgehog. According to Plutarch, *Moralia* 972 A, hedgehogs shift their positions as a sailor shifts sails. The same author tells us that a famous hedgehog weather-

seer lived at Cyzicus. An echo of these classical passages is to be found in Poor Robin's Almanack for the year 1733:

Observe which way the hedgehog builds her nest,
To front the north, or south, or east or west;
For if 'tis true that common people say,
The wind will blow the quite contrary way.

The squirrel, too, has the power of foreseeing storms, and, like the hedgehog, stops up the entrance toward which the wind is blowing (Pl. 8.138). A dog rolling on the ground indicates a violent wind (Th. 29). Many spider webs borne in the air betoken wind or a storm (Th. 29; Pl. 11.84). In general, when wild creatures approach cultivated lands, it signifies a north wind and a severe storm (Th. 47). Dolphins playing in a calm sea announce wind in the quarter from which they make their appearance^{63b} (Pl. 18.361).

CLEAR WEATHER

Nec minus ex imbris soles et aperta serena
prospicere et certis poteris cognoscere signis.

With these lines of *Georgics* 1.393-394 Vergil begins his long array of clear weather signs, seventeen lines of which are devoted to indications from the animal kingdom (*Georgics* 1.398-414). Williams translates the passage as follows:

Nor does the halycon sunward spread her wings
Along the sea-marge, bird to Thetis dear;
Nor do the filthy swine their sheaves of straw
Bite, but they toss them fiercely round the pen.
The misty clouds creep downward to the vales
And linger on the meadows; the night-owl
Watching from house-tops how the sun goes down
Now sings in vain her ominous even-song;
Aloft in cloudless air the osprey soars,—
Nisus he was, and Scylla feels her doom
For faithless theft of that one purple hair;
And where her wings escaping cleave the blue,
Lo, with a mighty whirr of wings her foe
Nisus, air-borne, pursues; where Nisus rides
Upon the wind, there too must Scylla fly
And cleave with panic wing the vacant blue.
Then with clear note and eager-throated voice
The crows three times and four repeat their cry,
And often in their airy dwelling feel
A strange new stir of joy, and hid in leaves
Make clamorous talk; they love when storms are done
To tend the small broods and dear nests once more.

In general, land birds flying in silence to watery places, or circling about amid a flock during a storm, are harbingers of clear weather (Ael. 7.7). When cranes take to flight and do not return, it indicates fair weather, for they do not depart before ascertaining that the sky is clear (Th. 52; Ar. 1010-1012). They proclaim fair weather by flying aloft in silence (Pl. 18.356). By flying leisurely they promise a fine day and still air (Ael. 7.7). Good weather will follow the screeching or hooting of an owl during a shower (Pl. 18.362), or during more stormy weather (Ael. 7.7)⁶⁴. This is true likewise of the 'sea-owl' (Th. 52).

⁶⁰Obviously a sort of sympathetic magic.

⁶¹Compare Ar. 918-919.

^{62a}A dead kingfisher suspended from the beam of a cottage ceiling, even if it is sheltered from the immediate influence of the wind, is supposed to show every change of the wind by turning its beak to the quarter from which the wind blows. At times stuffed birds are used for this purpose (see Dyer, 76). In Marlowe's *Jew of Malta*, 1633, we find the following: "But how stands the wind? Into what quarter peers my halycon's bill?"

^{62b}Aristotle, *Historia Animalium* 8.14.5; compare Pl. 10.66.

^{63a}"Bluefish, pike, and other fish jump with head towards the point from which a storm is coming": Dunwoody, 49.

^{63b}Compare Th. 52; Ar. 999-1001; *Geoponica* 1.2.6.

If one takes a mole⁶⁵ and puts it in a vessel with clay plastered round the bottom, it indicates by its cries either wind or fair weather (Th. 49). The wren announces fair weather by flying out of a hole, or an enclosure, or its nest (Th. 53). If oxen recline on the left side, it is going to be clear (Th. 54; Ael. 7.8). The same thing is true of dogs (Th. 54). When sheep are frisky, there will be a clear day (Ael. 7.8). If ewes begin to breed late in the season, it is a certain sign of the continuance of fair weather (Th. 54). When the wild sow farrows, that night falls no rain (Plutarch, *Naturales Quaestiones* 21). Clear weather will follow the appearance of hares in large numbers in the same places (Ael. 7.8). Prior to a calm, dolphins throw up the water on a billowy sea (Pl. 18.361).

It is going to be clear when solitary ravens caw twice, then caw in greater numbers, and finally seek their roosts in flocks with vociferous cawing⁶⁶ (Ar. 1003-1006); also when a raven by itself croaks quietly, or if it croaks thrice and then several times (Th. 52). When ravens flock together as if they were having a good time and then begin to caw, no rain is going to fall (Geoponica 1.2.6). Leisurely cawing of a crow in the evening summons a fine morrow (Ar. 1002; Ael. 7.7). The crow, if it caws thrice immediately after daybreak, indicates fair weather, and also when it caws quietly in the evening during a storm (Th. 53)⁶⁷.

Insects, too, are prophets of clear weather: bees, by swarming out from the hives (Pl. 11.20), ants by carrying their eggs in (Th. 22), and spiders by refraining from spinning⁶⁸ (Pl. 11.84).

FROST AND SNOW

Bees detect the approach of cold spells and frost (Ael. 1.11). The jackdaw, too, knows when frost is coming (Ael. 7.7). The chaffinch takes precautions against snow (Ael. 4.60). Contemporary weather lore has more to say on this subject than has survived in classical tradition. In Northern United States katydids begin to sing six weeks before frost; in the South the time is three months. "When locusts are heard, dry weather will follow, and frost will occur in six weeks" (Inwards, 149). In Scotland "Hares take to the open country before a snowstorm" (Inwards, 131). In Wales "The cat was thought to be a capital weather-glass. If she stood or lay with her face towards the

fire, it was a sign of frost or snow; if she became frisky, bad weather was near" (Owen, 340). One can still hear his country friends say: "When the crow flies low, it's a sign of snow"; "When wrens are seen in winter, expect snow"⁶⁹.

One can readily understand how a peasant could put trust in such weather signs as this paper records, but that an intelligent man should have confidence in more than a few of them is almost beyond belief. Cicero, *De Divinatione* 1.16, after translating from Aratus several typical weather signs, writes: *Sic ventorum et imbrium signa, quae dixi, rationem quam habeant, non satis perspicio; vim et eventum agnosco, scio, adprobo*. Vergil, *Georgics* 1.415 f., takes pains to refute the prevalent notion that animals, especially birds, are endowed by God or Fate with greater foresight than man in predicting the weather, and

explains their conduct, as Lucretius and the Epicureans and modern science would do, on natural grounds, stating that they are extremely sensitive to changes in the condition of the atmosphere, in fact that their physical organization makes them excellent barometers⁷⁰.

Says Burroughs, *Signs and Seasons*, 7:

To what extent the birds or animals can foretell the weather is uncertain. When the swallows are seen hawking high, it is a good indication: the insects upon which they feed venture up there only in the most auspicious weather. Yet bees will continue to leave the hive when a storm is imminent.

A sign may at times be ambiguous. In modern weather lore a cat with its tail up and hair apparently electrified indicates approaching wind, but as Inwards, 126, remarks, it may indicate also—a dog! Aratus (1142-1144) seems to be afraid of being taken too literally. He winks at the reader and tells him not to put complete confidence in any one of the signs he has enumerated; that it is better to have two pointing to the same thing; and that a person may have more assurance when there are three.

Doubtless some delicately constituted animals are sensitive to atmospheric changes, and an occasional sign may have some basis in reason. There is striking confirmation of such a possibility. When Helen Keller was seven years old, she was left alone for a few moments in the branches of a tree:

"Suddenly a change passed over the tree. All the sun's warmth left the air. I knew the sky was black, because all the heat, which meant light to me, had died out of the atmosphere. A strange odour came up from the

⁶⁵Woodcock has been suggested for *σπαλαξ*.

⁶⁶In the *Georgics*, the allusion is evidently to *rooks*, as is perhaps also the case, though more doubtfully, in Aratus, cf. W. W. Fowler, *A Year with the Birds* (3rd ed.), p. 234'; Thompson, 94.

⁶⁷Compare Ar. 1002; Ael. 7.7; *Geoponica* 1.2.6.

⁶⁸Compare modern folklore: "If spiders work in the morning early at their webs, there will be a fine day". "If spiders' webs <gossamer> fly in the autumn with a south wind, expect an east wind and fine weather". Fair weather will likewise follow if gnats fly in compact bodies in the beams of the setting sun. If bats flutter and bees fly about, there will be a fine morrow. See *Encyclopaedia of Superstitions, Folklore and the Occult Sciences*, 2.1135.

According to Dyer, 100, "In certain districts of Scotland, it is regarded as a token of fine weather, if the snail obeys the command to put out its horn:—

"Snailie, snailie, shoot out your horn,
And tell us if it will be a bonnie day the morn'".

⁶⁹In the southeast of Ireland should it <the robin> enter a house, it is said to prognosticate hard weather, snow, frost, etc. In Devonshire it often goes by the name of 'Farewell Summer' (Dyer, 65). In England, according to Dyer, 96,

'When dotterel do first appear,
It shows that frost is very near;
But when the dotterel do go,
Then you may look for heavy snow'.

One may know also when the snow is about to melt. "When little black insects appear on the snow, expect a thaw": Inwards, 149. In Wales, "If mole hills move, there will be a thaw": Owen, 349. In England, says Dyer, 200,

'If there's ice in November that will bear a duck,
There'll be nothing after but sludge and muck'.

⁷⁰So T. E. Page, in his note on *Georgics* 1.415.

earth. I knew it, it was the odour that always precedes a thunderstorm, and a nameless fear clutched at my heart"⁷¹.

In general, however, one is disposed to agree with Cornwall's couplet: "Those that are weather-wise are seldom otherwise".

It is impossible to separate the weather lore of the Greeks and the Romans. The Latin poets seem to be following blindly a Greek literary tradition⁷². They are obviously more indebted to their reading than to their own observation or to familiarity with weather lore of their own countrymen. If, however, all instances of prognostics which are the same in both Greek and Latin were to be ascribed to Greek sources, there would be but a small Roman residuum. The notion that the crow, for instance, is a weather prophet is almost as cosmopolitan as the bird, and it would be rash to say that the Roman peasant had no crow lore of his own. Still, even a casual reading of this article must leave one with the impression that the Greeks were more versatile, if not more accurate, prognosticators.

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REVIEWS

Die Griechische Tragödie. By Johannes Geffcken. Leipzig: B. G. Teubner (1918). Pp. 116.

Die Griechische Komödie. By Alfred Körte. Leipzig: B. G. Teubner (1914). Pp. 104.

These two books, belonging to the series entitled *Aus Natur und Geisteswelt*, are written for the average reader, by experts who have the will and the ability to interpret a subject in its larger relations. Körte's book is based upon a course of lectures delivered to a popular audience in Frankfurt. Both books are well done. While they are not addressed to scholars, a scholar may read them with profit, for though brief in compass they are new-minted coin.

Geffcken's *Tragedy* begins with a discussion of origins, and of the theater, then considers the early drama down through the Promethean trilogy, the Orestean trilogy, the earlier plays of Sophocles, *Antigone* and *Ajax*, and then the *Trachiniae*. This last piece, Geffcken holds, may be placed, on stylistic grounds, as first in time of a group which includes also *Oedipus Tyrannus* and *Electra*. In the *Trachiniae*, Euripidean influence begins to appear, for example in the character of *Deianira*, 'sketched with a pencil that is almost Euripidean'. This play serves as an introduction to Euripides, whose *Alcestis*, *Medea*, and *Hippolytus* are then passed in review. A reference to the character of *Phaedra* as a kind of challenge which Sophocles accepted in his lost tragedy, *Phaedra*, leads us back to Sophocles. The *Oedipus Tyrannus* is then quite fully discussed, with frequent indications that the author of

the discussion has been stimulated by Robert's *Oidipus*. Geffcken is a sympathetic critic, but he does not fail to touch upon the foibles of Sophocles, such as the excessive occurrence of the suicide motive, and the inevitable oracle. From this point on Geffcken passes back and forth, showing the play of action and reaction between the two contemporary poets. He deals with the *Electras*, with the extant *Philoctetes* of Sophocles as compared with the recoverable plots of the like-named tragedies of Aeschylus and Euripides, and with the *Phoenissae* of Euripides, considered as a treatment of the Theban story, over against the *Oedipus at Colonus*. The last play considered is the *Iphigenia at Aulis*, in which Geffcken finds Euripides truly himself in his portraiture of despicable old men, nobly impulsive young men, and generous womanhood. The book closes with a brief chapter on the effect of Greek tragedy.

While the whole book is suggestive, especial mention may be made of the warmth and the lightness of touch with which Euripides and the Sophists are treated. There is much of value in the chapter on Aeschylus, particularly in the way of observations upon his instinctive dramatic sense and the growth of his dramatic skill. Both the *Suppliants* and the *Prometheus* are treated not as isolated pieces but as members of a trilogy. This means something for the *Prometheus*, which has suffered much at the hands of the philosophical school. The true approach is, as Geffcken says, not philosophical but historical. Aeschylus is first a playwright, with a master's feeling for a great situation. Such a situation he found in the *Prometheus* story, as it came to him from the past. He shaped and combined his material with the instinct of a dramatist. The philosophical interpretation represents, then, not the mind of Aeschylus, but the reaction of his work upon later minds. The reciprocal influence of the young Sophocles and the older Aeschylus finds illustration in the character of the *Prometheus* as a transition play, connecting the earlier manner with the mature art of the *Oresteia*, while the *Triptolemus* of Sophocles is found to have been influenced by the *Prometheus*. In the *Antigone*, the much discussed verses, 904-920, are held to be genuine. Not that Geffcken admires this purple patch, for he does not. He holds with Masqueray that modern and ancient taste differ, and that this passage is a criterion of difference. Just as Sophocles gradually became Euripidean, so, Geffcken holds, Euripides was at first Sophoclean, for instance in making his *Alcestis* as unwavering as *Ajax* or *Antigone*. Geffcken has a keen eye for dramatic types. It is quite in accordance with the current view of the intimate relation of Euripides and later comedy that *Aegeus* in the *Medea* should be called the forerunner of the good uncle of comedy' and *Phaedra's* nurse 'a new Euripidean type, the procurress'.

Körte's *Comedy* follows a plan quite like that of Geffcken's *Tragedy*. In point of style the work is hardly so well phrased. After the opening chapter

⁷¹Helen Keller, *The Story of my Life*, 26.

⁷²Vergil is clearly under obligation to Aratus, and Aratus versifies the *De Signis* of Theophrastus, who in turn is indebted to Aristotle. Pliny, too, copied Greek sources.



Sex Determination and Sex Control in Antiquity

Author(s): Eugene S. McCartney

Source: *The American Journal of Philology*, Vol. 43, No. 1 (1922), pp. 62-70

Published by: [The Johns Hopkins University Press](#)

Stable URL: <http://www.jstor.org/stable/289330>

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V.—SEX DETERMINATION AND SEX CONTROL IN ANTIQUITY.¹

Some discoveries made early in the present century² have awakened a genuinely scientific interest in the question of sex determination and sex control. For the last two decades biologists have been attacking the problem with greater energy and with increased prospects of success. By varying the conditions of nutrition, moisture, and other factors, they have been able to control to a limited extent the sex of some of the lower animals. During this period of investigation there have appeared in *Science* some two dozen notes, articles, and book-reviews dealing with the subject.

The war, too, has brought the question into the foreground. A newspaper despatch from London in November, 1920, calls attention to the higher percentage of male babies since the war and goes on to say: "The doctors of England are discussing the peculiar manner in which nature is replacing the immense wastage of men during the war." There is, of course, a well-established popular notion about the increase in the number of boys during critical periods. It has been pointed out that a distinct increase in proportion of male babies has taken place among primitive peoples in times of stress and famine, or when tribes are in danger of extermination, as in the case of the head-hunting Dyaks of Borneo.

The research work of modern biologists gives more than a passing interest to the views of the ancients on sex determination. Aside from this, greater contemporary interest in folklore would justify an investigation of the notions of the Greeks and Romans.³

¹ The following abbreviations are used in this article: G. A. = Aristotle, *De Generatione Animalium*; Pl. = Plinius, *Naturalis Historia*; Censorinus = Censorinus, *De Die Natali*. Galen will be cited by Kuehn's edition. The translations of the *De Generatione Animalium* are Platt's.

² See Conklin, *Heredity and Environment*³, pp. 157-168, and also C. E. McClung, *The Accessory Chromosome, Sex Determinant?* *Biol. Bull.* 3, 1902.

³ The loci classici of the ancients are Aristotle, *De Generatione Animalium* 763b 29-767a 15; Plutarch *Moralia* 905D-F; Censorinus, *De Die Natali* 6. 6. 4-8; Galen, 19. 324 (Kuehn). Galen copies Plutarch. See also Galen, 4. 165-175.

In antiquity the custom of ancestor worship, the perpetuation of which required a son, since the daughter went off into another gens, was, perhaps, the strongest reason that led parents to long for male children. There was the additional consideration that the boy was a much more likely means of support for old age. The arrival of a boy was so much more welcome than that of a girl, and the natural desire of expectant parents to answer in advance the question of the sex of the coming child was so strong, that a search was made for indications of sex, and even for means to control it.

There was a common view that the male offspring comes from the right side of the male and the female from the left side,⁴ and that the embryo developed in the right side of the uterus was male while that in the left side was female.⁵ (G. A. 763b 35-764a 1). Only when there was an alteration in the course of nature did exceptions to this rule occur⁶ (Plut. Mor. 905 E). If during intercourse the right or left testis was tied up, the result was, according to some philosophers, male or female offspring respectively⁷ (G. A. 765a 21-25). Empedocles asserted that heat gave rise to males and cold to females⁸ (G. A.

⁴Cf. G. A. 765a 4-18; Plut. Mor. 905E; Censorinus 6. 6. 6; Galen 4. 174-175; 19. 453. See also Galen 4. 633. [See also the Johns Hopkins dissertation of A. P. Wagener, *Popular Associations of Right and Left in Roman Literature*, Baltimore, 1912, and especially the chapter on the *Association of the Right with the Male, of the Left with the Female*.—C. W. E. M.]

⁵Hippocrates ap. Kuehn's Galen 17A. 443; 17A. 1002; 17B. 212; 17B. 840; Plut. Mor. 905E; Galen 4. 175; 4. 633. In the last reference Galen explains why males are conceived on the right and females on the left.

⁶Galen 4. 174-175 explains the reasons for the exception to the rule that males are found in the right side of mothers and females in the left.

⁷So Galen 14. 476, but Hippocrates (Hippocratis Opera 1. 476 Kuehn) says that the right testicle should be bound to beget a female and the left to beget a male. It will be noted later on that this is the rule for animals. This is the logical view, given the notion that the right testicle begets males and the left females.

⁸So also Plut. Mor. 905D. Empedocles says elsewhere that boys are begotten in the warmer part of the womb, and that, therefore, men are darker, more stalwart and shaggier than women.—See Diels, *Fragmente der Vorsokratiker*, frag. 67, p. 202. Galen, 19. 453, says that the

764a 1-6). "Hence it is, as histories acquaint us, that the first men had their original from the earth in the eastern and southern parts, and the first females in the northern parts thereof. Parmenides is of opinion perfectly contrariant. He affirms that men first sprouted out of the northern earth, for their bodies are more dense; women out of the southern, for theirs are more rare and fine (Plut. Mor. 905 D).⁹

Democritus of Abdera opposed Empedocles' view, and said that sex depended on the parent whose semen it was that predominated (G. A. 764a 6-24). He maintained that the parts which are common to both sexes are engendered indifferently by one or the other, but the peculiar parts by the sex¹⁰ that is more prevalent (Plut. Mor. 905 F). Hippon said that the compact and strong sperm produced one sex and the more fluid and weaker the other,¹¹ and that if the spermatic faculty be more effectual the male is generated; if the nutritive element predominates, the female is generated¹² (Plut. Mor. 905 F). Hippocrates speaks in somewhat similar vein. He holds that there is both male and female semen, and that when females are born the stronger element is overpowered by the abundance of the weaker, and vice versa, that the birth of males is due to the overpowering of the weaker element (*Opera Hippocratis*, Kuehn, 1.377-78).¹³ The condition of the menses may also prove a factor, according to Hippocrates (op. cit. 1.476).

Aristotle thus summarizes a long discussion of his own views: "If, then, the male element prevails, it draws the female element into itself; but if it is prevailed over, it changes into the opposite or is destroyed¹⁴ (G. A. 766b 15-17).

warmer semen begets males, the colder, females. See also Censorinus 6. 6. 7.

⁹ Goodwin's translation.

¹⁰ Cf. the view of Leucippus (Plut. Mor. 905F).

¹¹ Cf. Censorinus, 6. 6. 4.

¹² Cf. Censorinus 6. 6. 4; Galen 4. 629.

¹³ Compare the view of Parmenides ap. Censorin. 6. 6. 5.

¹⁴ "I. e. in the mixture of the germ-cells of both parents, one or other gets the better in a sort of conflict. If the male prevails in this, then it causes the whole mixture to turn out a male, 'drawing into itself' the female, or in other words so influencing the material contributed by the female that the resulting embryo is male. In the other case, the male element is itself so influenced by the female, and

He makes other interesting comments: "For more females are produced by the young and by those verging on old age than by those in the prime of life; in the former the vital heat is not yet perfect, in the latter it is failing. And those of a moister and more feminine state of body are more wont to beget females, and a liquid semen causes this more than a thicker; now all these characteristics come of deficiency in natural heat.

"Again, more males are born if copulation takes place when north than when south winds are blowing. For in the latter case the animals produce more secretion, and too much secretion is hard to concoct; hence the semen of the males is more liquid, and so is the discharge of the catamenia" (G. A. 766b 29-767a 2).

Plants have certain properties by which they cause the conception of one sex or the other. The male plant of the parthenion ensures the conception of male children, the female plant of females, but only if immediately after conception its juice is drunk in raisin-wine and the leaves are eaten cooked in olive oil and salt, or raw in vinegar (Pl. 25.39). The lower part of the stem of the satyrium promotes the conception of male issue, the upper or smaller part of female (Pl. 26.97). Female offspring will result from taking thelygonon in drink, male by taking arsenogonon (Pl. 26.162).¹⁵ If before the evening meal, a man and woman take three *oboli* of the seed of crataegonon in three cyathi of water forty days before the conception of their issue, the child will be of the male sex (Pl. 27.62).¹⁶ If males eat the larger portions of the roots of cynosorchis¹⁷ or orchis, they will be parents of boys; if females eat the smaller part, girls will result¹⁸ (Pl. 27.65). The female phyllon plant ensures the conception of issue of the same sex, while the male plant, differing only in its seed, brings about male issue (Pl. 27.125). When a drink made from the crushed

therefore either 'changes into its opposite,' the total mixture becoming all female, or else 'is destroyed,' i. e., the principle carried by the male element disappears from the embryo."—Platt, ad loc.

¹⁵ Cf. Theophrastus, Hist. Plant. 9. 18. 5; Diosc. 3. 140.

¹⁶ Cf. Diosc. 3. 139, where directions are somewhat different.

¹⁷ Cf. Diosc. 3. 141.

¹⁸ We are not told what would happen if both sexes complied with directions at the same time.

leaves of the female plant of the linozostis is taken and an application of them is made to the genitals after purgation, the conception of females is ensured, while males result from similar treatment of the male plant (Diosc. 4.191).

The flesh of certain parts of animals has magical properties in ensuring the conception of male children. If, about the time of conception, a woman eats roasted veal with aristolochia, she will bring forth a male child (Pl. 28.254). When immediately after conception a woman eats cocks' testes, she becomes pregnant with a male child (Pl. 30.123). The eating of a hare's womb in one's food is supposed to effect the conception of males, a result also accomplished by eating the testicles of rabbits (Pl. 28.248).¹⁹ Smearing the body with goose grease and with resin from the terebinth tree for two days results in male offspring if intercourse takes place on the next day (Galen 14.476).

A woman could beget a male child if, prior to coition, she bound her right foot with a white fillet of a child, but a black ribbon on her left foot would cause the conception of a female (Galen 14.476). If parsley is placed upon the head of a pregnant woman without her knowledge, the sex of her unborn child will be that of the first person she addresses (Galen 14.476).²⁰

Some amusing instructions are given in Hippocrates, *De Steril.*,²¹ ch. 7: Take some milk, mix flour with it, form a paste, and bake it on a slow fire. If it is consumed by the fire, a male will result: if it cracks and splits, a female. Again, one may take milk and pour some of it on leaves. If it condenses, it means a male; if it runs, a female.

Cold waters cause the birth of females (G. A. 767a 35). On the tenth day after conception headache, mistiness before the eyes, distaste for food and a rising stomach are indications of the conception of a male child. A woman with a male child has a better color²² and the movement in the womb is felt on

¹⁹ Cf. Pl. 20. 263.

²⁰ In this same passage Galen gives still other curious lore.

²¹ The attribution of this work to Hippocrates is questioned.

²² See Hippocrates ap. Kuehn's Galen 17B. 834; Moschion, *De Mulierum Passionibus*, 26. Hippocrates (*De Steril.* ch. 7) says that women

the fortieth day.²³ There are opposite signs in the case of the female child and the first movement is felt on the ninetieth day (Pl. 7.41). Moschion (*De Mulierum Passionibus*, 26) says that the child is male if it moves in the womb soon after conception and vigorously, otherwise it is female. If the breasts of a pregnant woman are turned up, she will bear a male child; if they are turned down, female offspring will result (*Hippocrates De Steril.* ch. 7). The swelling of the right breast means a boy, of the left, a girl,²⁴ according to Moschion (*loc. cit.*).

Julia Augusta, when pregnant in her early youth by Tiberius Caesar, was particularly desirous that her offspring should be a son and accordingly employed a method of divination which was then much in use among young women. She carried an egg in her bosom, taking care, whenever she was obliged to put it down, to give it to her nurse to keep warm in her bosom in order that the temperature might be maintained. It is stated that this method was reliable (Pl. 10.154).²⁵

Although male children were preferred by human beings, farmers and shepherds naturally felt greater jubilation at the arrival of female animals. For beasts, too, there was considerable lore of sex determination. If sheep submit to the males when north winds are blowing, they are apt to bear males, says Aristotle (*H. A.* 573b 37); if when south winds are blowing, females.²⁶ Shepherds were not slow to take advantage of this fact and as they wanted breeders they admitted rams to the sheep during the prevalence of south winds (*Ael.* 7.27). Aris-

beget females if they have rough spots (perhaps freckles, rather than rough spots) on the face; those who keep a good complexion bear males.

²³ Cf. *Hippocratis Opera* (Kuehn), I. 453.

²⁴ If either of the breasts of a pregnant woman loses its fullness, she will part with one of her children. If it is the right breast which becomes slender, the male child will be lost; if the left, the female.—*Hippocrates ap. Kuehn's Galen* 17B. 828. This belief is founded on the rather prevalent physiological notion that the uterus consisted of two cavities, a right and a left one.

²⁵ Nana, the mother of Attis, conceived by putting a ripe almond in her bosom (*Paus.* 7. 17. 11), or a pomegranate (*Arnob. adv. Nat.* 5. 6).

²⁶ See also *Ael.* 7. 27; *Pl.* 8. 189; *Arist. ap. Colum.* 7. 3. 12; *Arist. ap. Pallad.* 8. 4. 4; *Antig. H. M.* 111.

totle's words are true of the bull (Geopon. 17.6) and, in fact, of animals in general (Geopon. 18.3).

If the right testicle of a ram is tied up, he will generate females only; if the left, males (Pl. 8.188).²⁷ The same thing occurs in the case of the bull (Geopon. 17.6) and indeed with almost all cattle (Colum. 6.28). If the cow has conceived a male, the bull descends from the cow more to the right, if a female, to the left (Varr. R. R. 2.5.13).²⁸ The mare is the only animal which after being covered runs facing the north or the south, according to whether she has conceived a male or female (Pl. 10.180).

We find Pausanias (7.22.11) thus describing the magical virtues of the river Charadrus: "The flocks and herds that drink of this river in spring usually bring forth males, and therefore the herdsmen remove them to another part of the country, all except the cows, which they leave at the river, because bulls are more suited than cows for sacrifices and for field labor; but in the case of other live stock the female is preferred."^{28a}

According to Aristotle (H. A. 559a 30), long pointed eggs are female; those that are rounded at the narrow end are male.²⁹ The converse is, however, asserted by other writers.³⁰

The ancients made an effort to control the sex even of some of the vegetables. "Of the turnip all do not agree that there are several kinds, but some say that the only difference is between the 'male' and 'female,' and that both forms come from the same seed. In order to produce 'female' plants, it is said that the seed should be sown thinly, for that, if it is sown thick, the result is all 'male' plants; and that the same result follows if the seed is sown in poor soil"³¹ (Theophrastus, Hist. Plant. 7.4.3).

In closing this paper it seems worth while to stop long enough to quote a few instances of sex-determination among other

²⁷ See also Pl. 30. 149; Colum. 6. 28; Geopon. 18. 3.

²⁸ See also Pl. 8. 176; Colum. 6. 24. 3; Geopon. 17. 6.

^{28a} Frazer's translation.

²⁹ Cf. Colum. 8. 5. 11.

³⁰ See Pl. 10. 145; Hor. Sat. 2. 4. 12-14; Antig. Mirab. 103.

³¹ Hort's translation.

peoples. According to the Jews, "if a woman is anxious to get sons, she must ask a shepherd to get the after-birth of a cow, dry it, and pound it, and drink the powder in wine."³² There are still other means of controlling the sex of a child: "Make a decoction of bear's or wolf's meat as much as a bean. If the animal is male the child will be male, and if it is female the woman will give birth to a daughter."³³ In Assyro-Babylonian tradition when a halo surrounded the moon, it was believed that women would bring forth male children;³⁴ "also, if the star Lugala or Sarru, 'the king,' stood in its place, women would likewise bring forth male offspring."³⁵ Among the Hindus it is believed that sons are born from cohabitation on the even nights, daughters as a result of cohabitation on uneven nights. A boy will be born if the seminal fluid predominates; a female embryo will be formed if the blood of menstruation is in excess.³⁶ There existed likewise a collection of Egyptian receipts for determining the sex of the infant to be born.³⁷

In the Southern Sporades, "the following plan tells the sex of a child which is to be born. A bone taken from the head of a fish called scar is placed on the mother without her knowing: the child will be of the same sex as the next person she calls."³⁸ In Cairo it is popularly believed that "if the husband loves the wife more than she loves him, all the children will be girls; if the converse is the case, all the children will be boys."³⁹ In the Isle of Man fairies made "a mock christening when any woman was near her time, and according to what child, male or female, they brought, such should the woman bring into the world."⁴⁰

In Kentucky "poultry raisers are interested in the first person who comes into their houses on New Year's Day. The sex of the caller signifies whether the house will raise pullets or roosters that year, and the size of the chickens will compare with the size of the visitors."⁴¹

³² Hastings, *Encyclopaedia of Religion and Ethics*, 2. p. 656.

³³ Loc. cit.

³⁶ Op. cit. 2. 650.

³⁴ Op. cit. 2, p. 643.

³⁷ Op. cit. 2. 647.

³⁵ Loc. cit.

³⁸ Folk-Lore 10, 182.

³⁹ Folk-Lore 11, 381.

⁴⁰ W. R. Halliday, *Greek Divination*, p. 40, quotes this at second-hand from Waldron, *History of the Isle of Man*.

⁴¹ Daniel L. and Lucy B. Thomas, *Kentucky Superstitions*, p. 212.

In Saibai, one of the islands in Torres Straits, "when a woman is pregnant, all the other women assemble. The husband's sister makes an image of a male child and places it before the pregnant woman; afterwards the image is nursed until the birth of the child in order to ensure that the baby shall be a boy. To secure male offspring a woman will also press to her abdomen a fruit resembling the male organ of generation, which she then passes to another woman who has borne none but boys."⁴²

Many other instances of attempts to control or determine sex might be noted,⁴³ but enough have been cited to show the universality of such practices. This resorting to magic by Greeks and Romans shows a solicitude for unborn children in striking contrast to the actions of those parents who exposed their offspring. One is probably safe in believing that each person who was willing to expose his child was many times outnumbered, not merely by parents who were deeply attached to children, but by people who resorted to magical means to ensure conception.⁴⁴

Many of the beliefs recorded in this paper are the product of the best Greek thought. Such notions are no longer held by the educated, although beliefs just as crude are still in existence even in the most civilized countries. It has not been many years since the members of a state medical society were urged to familiarize themselves with obstetrical superstitions in order to be able to assist the patient by refuting them.

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⁴² Frazer, *The Magic Art*, 1. 72.

⁴³ See E. S. Hartland, *Primitive Paternity* 1. 30-155 *passim*.

⁴⁴ Compare La Rue Van Hook, *The Exposure of Infants at Athens*, T. A. P. A. 51. 134-145.



The Folk Calendar of Times and Seasons

Author(s): Eugene S. McCartney

Source: *The Classical Weekly*, Vol. 16, No. 1 (Oct. 2, 1922), pp. 3-7

Published by: [Classical Association of the Atlantic States](#)

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knowledge for our students, and their part to trust our judgment. They will do so when we show ourselves capable of that act of selection and criticism which underlies all education. They will welcome required courses which are complete and informing in themselves, and not merely prerequisite to special study. They will respond to instruction, which, whether on the literary or scientific side, is humanistic and exemplary of great historic and personal endeavors.

What a fine thing for education it would be, if the men who are controlling, or at least seem to control, the destinies of education in our great country, would take to heart, as their guiding principles, not only for collegiate education, but for education in the High Schools as well, the ideas set forth by Professor Mather in this most interesting and suggestive paper.

C. K.

THE FOLK CALENDAR OF TIMES AND SEASONS¹

In THE CLASSICAL WEEKLY 14. 89-93, 97-100, I collected instances of weather prognostics derived from the actions of birds, beasts, fish, and insects². The present paper aims to complete a study of the weather lore of animals³ by noting their associations with times and seasons.

Aristophanes, Aves 709, makes the birds say: 'We first show the signs of the season, spring, winter, and autumn'. Of similar purport is Jeremiah 8.7: 'Yea, the stork in the heaven knoweth her appointed times; and the turtle and the crane and the swallow observe the time of their coming'. "Part, more wise, . . . wedge their way intelligent of seasons", sings Milton of the birds, in Paradise Lost 7. 425-427. A well-known American ornithologist writes that "to the lover of Nature, birds are a living calendar"⁴.

Doubtless the arrival and the departure of birds were far more dependable indications of the season than was the calendar so long as entire months had to be intercalated. The peasantry would naturally continue the use of the ornithological calendar even after the new-fangled human device had been improved⁵.

SPRING

No bird is more closely associated with the advent of a new season than is the swallow, the *avant-coureur* of spring. In Rhodes every year the arrival of this bird was celebrated by children who went the rounds of the houses singing the song which begins, 'The swallow, the swallow is come, bringing good seasons and a joyful time'⁶.

¹The following abbreviations are used in this paper: Abbott = G. F. Abbott, Macedonian Folklore; Ael. = Aelianus, De Natura Animalium; Ar. = Aratus, Prognostica, as appended to the Phaenomena and numbered consecutively with it; Ar. Aves = Aristophanes, Aves; Geopon. = Geoponica; Hesiod = Hesiod, Works and Days; Pl. = Plinius, Naturalis Historia; Th. = Theophrastus, De Signis; Bergk = Bergk, Poetae Lyrici Graeci. ²See also Professor A. S. Pease's annotations on Cicero, De Divinatione, Liber Primus, University of Illinois Studies in Language and Literature, 6. 79-80, *passim*.

³The word *animals* is used in the Latin sense.

⁴Chapman, Birds of Eastern North America, 5.

⁵"Time among the Macedonian peasantry is measured not so much by the conventional calendar as by the labours and festivals which are proper to the various seasons of the year" Abbott, 11.

In this connection readers will recall a vase-painting which is reproduced in Schreiber, Atlas of Classical Antiquities, Plate LXIV⁷. On it is depicted a young man who, as he catches sight of a swallow, exclaims, 'Look, a swallow!'. An older man turns and answers, 'Yes, by Heracles!'. On the right a boy glances upward and says, 'Spring's already here'. The animation and excitement of the group show that it is no small event in their lives. Such scenes must have been common in Greece, as we can readily infer from Aristophanes, Equites 419, 'Look, lads, don't you see? The new season, a swallow'⁸.

The swallow tells when it is time to sell heavy winter robes and to acquire lighter dress (Ar. Aves 714-715). Pliny says (18.237) that the first appearance of the swallow is eight days before the Kalends of March. We may infer from a Greek proverb that an occasional swallow missed its cue and came upon the scene too soon: 'One swallow does not make a spring'⁹. Babrius (131) does in fact tell us of a swallow which appeared out of season. The Greek proverb has a numerous progeny: e. g. in French, Une hirondelle ne fait pas le printemps; in Italian, Una rondine non fa l'estate; in Spanish (Don Quixote), Una golondrina sola no hace verano; 'One swallow doesn't make a summer'¹⁰.

In our own country the robin seems to have the place of the swallow in Greece: compare Lowell, My Study Windows, "The return of the robin is commonly announced by the newspapers, like that of eminent or notorious people to a watering-place, as the first authentic notification of spring".

Professor E. W. Martin, The Birds of the Latin Poets, 223, has collected some poetic references to the robin as a bird of spring: "The robin the forerunner of spring" (Longfellow); "I hear the whispering voice of Spring, The thrush's trill, the robin's cry" (Holmes); "The robins are come again with tender melodious note" (Mace)¹¹.

Sooner than other birds came the cuckoo proclaiming spring (Dionysius, De Avibus 1.13)¹². From the

⁷Athenaeus 8.360 C. For references to modern swallow-songs, see Thompson, A Glossary of Greek Birds, 189; Hastings, Encyclopaedia of Religion and Ethics, 1.528; Abbott, 18-19.

⁸A picture is to be found also in Baumeister, Denkmäler des Klassischen Altertums, 3.1985, and in Jane Harrison, Themis, 98.

⁹Compare Christina G. Rossetti, A Bird Song, 812: 'It's surely summer, for there's a swallow: Come one swallow, his mate will follow, The bird race quicken and wheel and thicken'.

¹⁰Aristotle, Nicomachean Ethics 1.7.16; 'There seem to be lacking not a few swallows', Ar. Aves 1417. For other references to the swallow and spring, see Hesiod 568; Simonides 74 (Bergk); Aristophanes, Pax 800, Aves 714; Thesmophoriazusae 1; Ael. 1.52; Anthologia Palatina 10.14.5; Varro apud Augustinum, De Musica 4.15; Cicero, Ad Atticum 9.18.3, 10.2.1; Horace, Epist. 1.7.13, Carm. 4.12.1; Calpurnius, Ecl. 5.16-17; Ovid, Fasti 1.157-158, 2. 853; Pl. 2.122; Columella 10.80; Pervigilium Veneris, ad finem.

¹¹Compare the current Macedonian saying, 'One cuckoo does not make a spring'; Abbott, 10.

¹²In America the bluebird shares with the robin the honor of announcing spring. Professor Martin also cites the following passages, the first from Longfellow, the next two from Bryant, the fourth from Emerson: "And from the stately elms I hear The bluebird prophesying Spring"; "And bluebirds in the misty spring Of cloudless skies and summer sing"; "The bluebird chants, from the elm's long branches, A hymn to welcome the budding year"; "Sparrows far off, and nearer April's bird Blue-coated flying before from tree to tree". In The Biglow Papers Lowell calls the bobolink "June's bridesman, poet of the year". <For a review of Professor Martin's book, by Professor W. B. McDaniel, see THE CLASSICAL WEEKLY 10.143-144. C. K. >.

¹³Compare Aristotle, Historia Animalium 9.49 B; Ael. 3.30, ad finem.

fact that the cuckoo was a harbinger of spring arose a humorous custom among the peasantry. At those who had not finished their vine-dressing before its arrival was hurled the taunting cry, 'Cuckoo! Cuckoo!' (Pl. 18.249). Allusion is made to this custom in Horace, *Serm.* 1.7.28-31¹³. To-day in Macedonia the charcoal-burner who is plying his calling rather late in spring is greeted by boys with the same cry, 'Cuckoo! Cuckoo!' (Abbott, 17).

How eagerly the coming of the cuckoo was looked for is shown by the following lines¹⁴:

Opto meus veniat cuculus, carissimus ales.
Omnibus ille solet fieri gratissimus hospes
in tectis, modulans rutilo bona carmina rostro. . . .
Opto meus veniat cuculus cum germine laeto,
frigora depellat, Phoebos comes almus in aevum.
Phoebus amat cuculum crescentem luce serena¹⁵.

Another harbinger of spring is the stork: *avis exul hiemis, titulus tepidi temporis* (Petronius 55). In Isidorus, too (Origines 12.7.16), storks are *veris nuntiae*¹⁶. Sappho chooses another bird¹⁷, 'The angel of spring, the mellow-throated nightingale'¹⁸. The arrival of the kite, too, ushers in the spring (Ar. Aves 713)¹⁹. The halcyon is probably designated by 'the sea-purple bird of spring' (Alcman, *Frag.* 26). The finch, starling, and sparrow are likewise harbingers of spring (Martial 9.54.7-8). Pliny tells us (18.209) that because of the extreme delicacy of butterflies some people looked upon their arrival as the surest sign of spring²⁰. The cicada is held in honor as the pleasing prophet of summer²¹. Wild-pigeons were the surest harbingers of summer²².

The weather instinct of the lower orders was not always infallible. Pliny makes note (18.209) of one year in which the foreign birds brought on the sixth day before the Kalends of February every indication of an early spring, yet had to struggle after that with a winter of the utmost severity. In the same year three separate flights of butterflies, the most dependable prophets, were killed. Summer birds were sometimes killed when the cold lingered rather late or came too early; winter birds met the same fate from unexpected hot spells (Pl. 18.208). These pas-

sages remind one of a comment in Lowell, *My Study Windows*:

Birds frequently perish from sudden changes in our whimsical spring weather of which they had no foreboding. More than thirty years ago, a cherry-tree, then in full bloom, near my window, was covered with humming-birds benumbed by a fall of mingled rain and snow, which probably killed many of them.

WINTER

Even in Homeric days the fall migration of cranes was a reminder that winter was approaching (*Iliad* 3.3-4)²³. Their cries as they departed suggested that it was time to weave a cloak (Ar. Aves 710-712). The chaffinch knows the future better than man does and foresees the coming of winter (Ael. 4.60). Wild-pigeons announce the approach of winter as well as of summer²⁴ (Athenaus 491 B). When bees huddle together in late autumn before the rising of the Pleiades, expect a hard winter (Ar. 1064-1067, 1071). If in late autumn sheep or cattle tear up the ground and lie down in groups with their heads close together, or if they face the north, their actions indicate a stormy winter (Th. 41)²⁵, but if they continue tearing up the ground, then expect a severer winter, hard upon plants and crops and fields, but bringing snow that will aid the large fields of grain not too far advanced (Ar. 1082-1090).

It is an indication of a severe winter when sheep, pigs, and goats have a second breeding-season (Ar. 1068-1071)²⁶. If sheep begin to breed early, winter will come early (Th. 40; Ael. 7.8), but when they breed late the winter will be moderate (Ar. 1072-1074).

All fish are able to presage a vigorous winter, especially those which are supposed to have a stone in the head, as the *lupus*, *chromis*, *sciaena*, and *phagrus* (Ael. 9.7; Pl. 9.57).

Predictions about the character of the coming winter are common in popular lore. Among the Pennsylvania Dutch, for instance, it is believed that "If the lower legs of chickens are well covered with feathers, the winter will be severe"; "If chickens moult first on the fore part of the body, the early part of the winter will be severe; if on the rear, the end of winter"; "When earthworms lie near the surface late in fall, the winter will be mild"; "Hairy down on geese foretells a hard winter"; "Very heavy fleece on sheep indicates a hard winter"²⁷.

An aunt gives me some elaborate lore about 'the large brown caterpillar' seen in the fall:

If it is all light in color, it denotes a mild winter; if it is dark at the head and the rest of the body is light, the coldest weather will be at the beginning of the winter, and the rest of the winter season mild; if all the body is light except the tail and it is dark, the first part of the winter will be mild, and the latter

¹³In Italian *cuculiare*, 'to cuckoo', means 'to ridicule'. The peasants of Piedmont still have a motto and a gesture harking back to this old custom. See Gubernatis, *Zoological Mythology*, 2.233.

¹⁴Anthologia Latina (Reise), Volume 1, No. 687.

¹⁵Compare "The merry cuckoo, messenger of spring, His trumpet shrill hath thrice already sounded" (Spenser, *Sonnet* 19); "While I deduce From the first note the hollow cuckoo sings The symphony of springs" (Thomson, *The Seasons*, Spring 576-578); "Thrice welcome, darling of the spring" (Wordsworth, *To the Cuckoo*); "Hail, beauteous stranger of the grove! Thou messenger of spring! Now heaven repairs thy rural seat, And words thy welcome sing" (John Logan, *To the Cuckoo*).—For spring lore of the cuckoo in old English poetry see the initial pages of J. Hardy, *Popular History of the Cuckoo*, *Folk-Lore Record* 2.47-91.

¹⁶Compare Sidonius, *Epist.* 2.14.2.

¹⁷*Frag.* 39 (Bergk); *Odyssey* 19.518-519; Simonides, *Frag.* 73; Ar. Aves 683; Sophocles, *Electra* 149.

¹⁸Compare "The dear good angel of the spring, The Nightingale": Ben Jonson, *The Sad Shepherd*.

¹⁹See also the scholiast on the passage.

²⁰"A white butterfly means rainy weather, a dark one thunderstorm and a yellow one sunshine": Hastings, *Encyclopaedia of Religion and Ethics*, 1.506.—"When the butterfly comes, comes also the summer": Dunwoody, *Weather Proverbs*, Signal Service Notes, No. IX, 127.

²¹Bergk 3.316. See also Ovid, *Ars Amatoria* 1.271; *Anthologia Palatina* 9.122.

²²Moiro apud Athenaeum 491 B.

²³Compare Hesiod 448; Euripides, *Helena* 1478; Vergil, *Aen.* 6.310-312.

²⁴The Pleiades (compare *peleiades*, 'wild pigeons') announce the same seasons (Ar. 266-267).

²⁵See also Ar. 1082-1085; Geopon. 1.4.3.

²⁶See also Aristotle, *Historia Animalium* 575 B, 17; Th. 25; Geopon. 1.4.2.

²⁷E. M. Fogel, *Beliefs and Superstitions of the Pennsylvania Germans*, *Americana Germanica* 18. 221-232, *passim*.

part severe; if both ends are dark and the middle light, the beginning and end of the winter will be severe, with a mild spell in between; if it is all dark, the entire winter will be severe²⁸.

SOLSTICES

Animals are well aware of the advent and the departure of the solstices. The tunny is so sensitive to the time of the equinoxes and the solstices that he teaches even man himself without the help of any astrological table; for where the winter overtakes him, there he remains till the vernal equinox (Plutarch, *Moralia* 979 C-D; Ael. 9.42). The ram, too, has accurate knowledge of the coming of the summer solstice, for on that date he begins to rest on his right side after reclining on his left for six months (Ael. 10.18). The cooing of the ring-dove is another indication of the summer solstice, but, until the wood-pigeon is sitting on her eggs, one is to beware of supposing that this period is past (Pl. 18.267). The golden oriole comes about the time of the summer solstice and departs with the rising of Arcturus (Aristotle, *Historia Animalium* 9.22.1)²⁹. The greenfinch observes the same dates (Ael. 4.47). The bee is thought to announce the solstices by going to its labors³⁰. It appears that cicadas sing only after the (spring) solstice³¹.

COCK CROWING

Considerable lore has clustered about the crowing of the cock. It is called 'hour-seer'³², 'day-announcer'³³, 'dawn-crower'³⁴, and, like Rostand's chanticleer, is said to bring the dawn³⁵. The crowing of the cock was the sign for rising³⁶; it was really a sort of alarm clock, for the Greek name, *alektryon*, was popularly said to be due to the cock's rousing people from bed (*lektron*)³⁷. According to one story, the cock was once a youth named Alektryon. The crowing at dawn is an everlasting memento of the disgraceful failure of the human original to keep awake and to announce to amorous Ares and Aphrodite the coming of dawn³⁸.

In popular belief the cock marked the periods of the day every three hours by his crowing (Pl. 10.46). The last watch of the night, called by the Greeks

*alektorophonia*³⁹, was divided into three parts. The first cock-crow is referred to by Theocritus (18.56), the second by Juvenal (9.107)⁴⁰, the third, indicating the end of twilight, by Theocritus (24.63)⁴¹. In Attica the song of the nightingale, too, marked the beginning of the day⁴².

In our own weather-lore the cock indicates a change of weather by crowing at nine o'clock. Among the Pennsylvania Dutch the crowing of the cock before nine at night portends rain⁴³.

NAVIGATION

'A bird will always say to one
Divining whether he should sail,
"Do not sail now: a storm will come",
"Sail now: your venture will not fail".'

Thus upon the sea, too, do birds prove useful (Ar. *Aves* 596-597). When the swallow comes, boats may prepare to put to sea (*Anthologia Palatina* 10.1, 10.14.7). Plutarch (*Moralia* 983 A) tells us that, when the halcyon brings forth her young about the time of the winter solstice, the whole ocean for seven days and seven nights remains calm and undisturbed without the wrinkle of a wave. During this period men voyage upon the sea with greater safety than they travel upon the land⁴⁴. The departure of the crane warns the ship-master to hang up his rudder, and sleep (Ar. *Aves* 710-711). In the previous paper⁴⁵ we saw how birds and even fish proved useful to the mariner by forewarning him of an approaching storm and indicating even the direction of the coming wind.

FARMING OCCUPATIONS

'We regulate the acts of man,
Whatever great things mortals plan'.

So speak the birds in Aristophanes, *Aves* 708. Certainly the seasons for many farming operations are indicated by them. The best time for planting vineyards is when the stork makes its appearance in the spring (Vergil, *Georg.* 2.319-320). Pruning should be done before the swallow comes (Hesiod 569). There will be a good vintage if the hoopoe cries before the vines sprout (Horapollo 2.92). When the returning swallow bedaubes her nest with mud, release the flocks from their winter-quarters (Calpurnius, *Ecl.* 5.17-18). The arrival of the kite is the time for spring shearing (Ar. *Aves* 713-714). If, when the cuckoo 'cuckoos' for the first time in the leaves of the oak, Zeus sends rains on the third day, and if the water neither rises above the ox's hoof nor falls below it, then the late plowman will vie with the early one in prosperity (Hesiod 486-490). In Egypt the cuckoo was autocratic, according to Aristophanes, *Aves* 504-506:

²⁸A few other methods of predicting the character of the winter may be noted. "The trappers say that they can tell whether the winter will be hard or open by the amount of food stored up in the coney barns": E.T. Seton, *Wild Animals at Home*, 168.—"When he <the farmer> kills his hogs in the fall, if the pork be very hard and solid, he predicts a severe winter; if soft and loose, the opposite": Burroughs, *Signs and Seasons*, 14.—"In early and long winters the beaver cuts his winter supply of wood and prepares his house one month earlier than in late mild winters": Inwards, *Weather Lore*, 130.—"When birds and badgers are fat in October, expect a cold winter": Inwards, 36.—"An early appearance of the woodcock indicates the approach of a severe winter": Inwards, 135.—"Tortoises creep deep into the ground so as to completely conceal themselves from view when a severe winter is to follow. When a mild winter is to follow, they go down just far enough to protect the opening of their shells": Dunwoody, *Weather Proverbs*, *Signal Service Notes*, No. IX, 118.—"If the mole dig his hole two feet and a half deep, expect a very severe winter; if two feet deep, not so severe; if one foot deep, a mild winter": Dunwoody, 32.—"If the forward part of a pig's melt is thicker than the other end, the first part of the winter will be the colder. If the latter end is thicker, the last part of winter will be the colder": Dunwoody, 32.

²⁹See also Pl. 10.87, 18.292.

³⁰Aristotle, *De Mirabilibus Auscultationibus* 64.

³¹*Ibidem*. The Oxford translation of Aristotle renders the passage as follows: "The grasshoppers appear to chirp only after the solstices". See also Pl. 11.107.

³²Babrius 124.15. ³³Simonides apud Athenaeum 374 D.

³⁴Eustathius in *Odysseam* 4.10. ³⁵*Anthologia Graeca* 5.2.

³⁶Aesop 44; Cicero, *Pro Murena* 22; Horace, *Serm.* 1.1.10.

³⁷Eustathius, as cited in Note 34; compare Athenaeus 374 D.

³⁸Lucian, *Gallus* 3; Scholium on Ar. *Aves* 835.

³⁹Compare Mark 13.35: "Watch ye therefore: for ye know not when the master of the house cometh, at even, or at midnight or at the cockcrowing, or in the morning".

⁴⁰Compare Mark 14.72: "And the second time the cock crew. And Peter called to mind the word that Jesus said unto him, 'Before the cock crow twice, thou shalt deny me thrice'".

⁴¹For other references to the crowing of the cock, see Thompson, *A Glossary of Greek Birds*, 21-22.

⁴²Philostratus, *Heroica* 665.

⁴³Fogel, *Beliefs and Superstitions of the Pennsylvania Germans*, *Americana Germanica* 18.224.

⁴⁴For an extensive list of references to halcyon days see Thompson, *A Glossary of Greek Birds*, 30, and O. Gruppe, *Griechische Mythologie und Religionsgeschichte*, 2 (1896), 842, N. 7.

⁴⁵THE CLASSICAL WEEKLY 14.97-98.

And the whole of Phoenice and Egypt was erst by a masterful cuckoo commanded.

When his loud cuckoo-cry was resounding on high, at once the Phoenicians would leap

All hands to the plain, rich-waving with grain, their wheat and their barley to reap⁴⁶

Yorkshire farmers take a practical hint from the early or the late arrival of the cuckoo: "When cuckoo calls on the bare thorn, Sell your cow and buy your corn"⁴⁷.

The farmer who does his work on time rejoices when flocks of cranes appear in due season, but the backward tiller of the soil is pleased at their later arrival, since crops planted late have time to mature (Ar. 1075-1081). The departure of cranes for Libya is a warning that it is time to do fall plowing (Hesiod 448)⁴⁸. After the stork leaves, it is not advisable to sow rape (Pl. 18.314).

When, as summer comes, a farmer on the mainland sees large numbers of birds from the islands alight on ploughed fields, it is not a cause for rejoicing, for he fears that the ears of grain will fail to fill out because of impending drought. The heart of the shepherd is glad when they come in moderate numbers, as he is hopeful of good pasturage and a milk-producing year (Ar. 1094-1100). It is explained in a scholium to Aratus (1094) that islands become parched more quickly than the mainland. When birds fly to the mainland in large numbers, farmers conclude that it will soon be as parched as the islands; if only a few come, the islands are still productive and crops on the mainland are not yet in danger.

'When the house-carrier < the snail > climbs up the plants from the earth to escape the Pleiades, then it is no longer the season for digging vineyards, but to whet your sickles and rouse up your slaves' (Hesiod 571-573). The advent of a lion into a crop-producing country means a dry spell (Ael. 7.8)⁴⁹. The appearance of many cicadas indicates that the year will be pestilential (Th. 54).

MISCELLANEOUS

There is a sign that points both to the ripening of the barley and the sowing of panic-grass and millet, the glow-worm shining in the fields at night (Pl. 18.250). Goats are plumpest and wine sweetest when the artichoke flowers, and the cicada sits in a tree and pours down his shrill song continually in the season of wearisome heat (Hesiod 582-585). There is a wild beast, named by the Egyptians *oryx*, which, when the dog-star rises, is said to stand opposite to it, to look steadfastly at it, and then to sneeze as if worshipping it (Ael. 7.8; Pl. 2.107). There is no doubt that during the whole of this period dogs are disposed to become rabid (Pl. 2.107)⁵⁰. When animals in Pontus

face northward as they graze, one may know that Arcturus is rising (Th. 41).

PROPHYLACTIC WEATHER LORE

As the ancients were interested in predicting changes in the weather, so they were concerned about finding means of averting the destructive elements. In the same way that vineyards were conspicuous in the lore of farming operations, so we shall find them engrossing much of the attention in prophylactic weather lore. Hail was a dreadful menace to vineyards in antiquity. There are more magical formulae for averting it than for affecting any other action of the elements⁵¹. One is tempted to conclude that hail-storms were more frequent in Italy in antiquity than is the case to-day. Two years in Italy have left upon me no impression that they are commoner than in the United States. According to Columella, 10.329-330, *Saepe ferus duros iaculatur Iuppiter imbres, grandine dilapidans hominumque boumque labores*.

Hail-storms could be averted by carrying around one's property the skin of a crocodile, hyena, or seal, and by hanging it at the entrance of the villa. Clouds menacing the welfare of vineyards would pass by if one suspended in his right hand a marsh turtle and carried it head downwards around a field, and then, after retracing his steps, buried it upside down so that it could not right itself (Palladius 1.35.14; Geopon. 1.14).

At the town of Cleonae there were hail-storm pickets maintained by the public to watch for hail-clouds. When the clouds were seen approaching, a signal was given and the farmers hastened to sacrifice lambs or fowls⁵². At times watchmen averted a hail-storm by making an offering of mole's blood (Plutarch, *Moralia* 700 F). Among other things useful for averting or restraining hail were the skin of a hippopotamus (Geopon. 1.14.12), a strip of seal-skin tied around a conspicuous vine (Geopon. 1.14.3)⁵³, owls with outstretched wings nailed to houses (Palladius 1.35.1), the right wing of an eagle buried in the middle of a field (Geopon. 1.14.2), and wooden statues of bulls set up in the home (Geopon. 1.14.7)⁵⁴.

Under certain conditions a woman can exert a magical influence upon hail-storms, whirlwinds, and lightnings, and succeed in averting them (Pl. 28.77)⁵⁵. If a bramble-frog is buried in the middle of a field of grain in a new earthen vessel, there will be no storms to cause damage (Pl. 18.294). At Methana in Troezen, according to Pausanias 2.34.2,

"When the vines are budding, and a south-wester sweeps down on them from the Saronic Gulf, it blights tender shoots. So, while the squall is still

⁴⁶Rogers's translation.

⁴⁷W. Henderson, *Folk-Lore of the Northern Counties*, 94.

⁴⁸Theognis 1197-1199.

⁴⁹"When the frogs spawn in the middle of the water, it is a sign of drought; and when at the side, it foretells a wet summer": Inwards, *Weather Lore*, 145.—"Should the cuckoo make its appearance before the leaves appear on the hawthorn bush, it is a sign of a dry barren year": E. Owen, *Welsh Folk-Lore*, 318.—"If this bird < the magpie > builds her nest at the top of a tree, the summer will be dry; if in the lower branches, the summer will be wet": Owen, 327.

⁵⁰Compare Pliny 8.152.

⁵¹When Constantine was trying to repress magic, he excepted those *remedia* which were intended to avert hail and storms. See *Codex Theodosianus* 9.16.3. <On hail-storms in Italy see some interesting remarks by Sir Archibald Geikie, *The Love of Nature Among the Romans*, 246-248. c. K. >

⁵²Seneca, *Quaestiones Naturales* 4.6.2; Clemens Alexandrinus, *Stromata* 6.31.1-3.

⁵³Compare Philostratus, *Heroica* 685.

⁵⁴"In many parts of White Russia people eat a roast lamb or sucking-pig at Easter, and then throw the bones backwards upon the fields, to preserve the corn from hail": Frazer, *The Spirits of the Corn and of the Wild*, 1.300.

⁵⁵*Iam primum abigi grandines turbinesque contra fulgura ipsa mense nudato: sic averti violentiam caeli, in navigando quidem tempestates etiam sine menstruis.*

coming, two men take a cock, every feather of which must be white, rend it in two, and run around the vines in opposite directions, each carrying a half of the cock, and when they come back to the place from which they started, they hang the pieces there. This is their device for counteracting a southwester"⁵⁶⁻⁵⁷.

To ward off frost after pruning, the knives should be secretly smeared with bear's fat, or with goat's fat, or the blood of a frog (Geopon. 5.30).

Lightning, too, was always a cause of grave concern to both Greeks and Romans. In order to avoid being struck, the Emperor Augustus carried with him the skin of a seal (Suetonius, Augustus 90). Timid persons considered as safe tents made of seal-skin, since they believed the seal to be the only marine animal never struck by lightning (Pl. 2.146). The hyena's skin, as well as the seal's, was lightning-proof (Plutarch, Moralia 684 C).

So efficacious were the skins of seals and hyenas that they were affixed to the mast-heads of ships carrying royalty or dignitaries⁵⁸. The skin of a hippopotamus buried in the middle of a field was supposed to prevent thunderbolts from falling on it (Geopon. 1.16). In Irish-Canadian superstition swallows are better than lightning-rods. In E. T. Seton, Two Little Savages, 72, we find the following incident:

Lightning never strikes a barn where swallows nest. Paw never rested easy after the new barn was built till the swallows nested in it. He had it insured for a hundred dollars till the swallows got round to look after it⁵⁹.

A marvelous story is told about the *echeneis*, a mythical fish. Though very diminutive, it was supposed to have the power of counteracting the most violent waves, and of controlling the fury of wind and storm. It could bridle the impetuous rage of the deep. Simply by affixing itself to a ship, it could make it stand still at a time when cables and ponderous anchors were powerless (Pl. 32.2)⁶⁰. Pliny goes on to narrate some extraordinary feats of this fish in stopping war-ships.

Storms might be produced as well as averted. It was thought that, if the head and neck of a chameleon were burnt in a fire made with logs of oak, it would be productive of a storm with rain and thunder, a result equally well achieved by burning the liver under tiles (Pl. 28.113). Seton, Two Little Savages, 72, again provides a parallel from Irish-Canadian superstition:

⁵⁶Frazer's translation.

⁵⁷Frazer, Folk-Lore 1.163, cites an illuminating East Indian parallel: "When the sky is overcast, the skipper of a Malay prao takes the white or yellow feathers of a cock, fastens them to a leaf of a particular sort, and sets them in the fore-castle, with a prayer to the spirits that they will cause the black clouds to pass by. Then the cock is killed. The skipper whitens his dusky hand with chalk, points thrice with his whitened finger to the black clouds, and throws the bird into the sea. Clearly the idea of the Greek husbandman and the Malay skipper is that the white-winged bird will flutter against and beat away the black-winged spirit of the storm". In The Magic Art, 1.295-296, Frazer records instances of rabbits and serpents used to stop rain.

⁵⁸Plutarch, Moralia 664 C; Nonnus, De Morborum Curatione, Chapter 260; Lydus, De Ostentis 45 C.

⁵⁹"It <the swallow> preserves the house on which it builds from fire and storms, and protects it from evil": W. Henderson, Folk-Lore of the Northern Counties, 122.—The Germans have the same belief, according to Dyer, English Folk-Lore (1880), 69.

⁶⁰See also Pl. 9.79; Ael. 2.17; Plutarch, Moralia 641 B.

Kill a spider an' it will rain tomorrow. Now that's worth knowin'. I mind one year when the Orangemen's picnic was comin', 12th of July. Maw made us catch twenty spiders and we killed them all the day before, and law, how it did rain on the picnic! Mebbe we didn't laugh. Most of them had to go home in boats, that's what our paper said! But next year they done the same thing on us for St. Patrick's day, but spiders is scarce on the 16th of March, an' it didn't rain so much as snow, so it was a stand-off.

It is a popular belief of Canada and the United States that, if you kill a snake and hang it on a tree or fence, it will cause rain. In The Magic Art, 1.287-295, Frazer gives instance after instance of animals used to cause rain. In many of these illustrations dark-colored animals bring the black rain-clouds.

MIGRATIONS AND THE SEASONS

The connection of the birds with the weather is not difficult to understand. Where calendars are not invented, the seasons are marked by the recurrence of natural phenomena, particularly by the advent of migratory birds. The swallow arrives at the beginning of spring; unsophisticated man believes that it brings the spring.

So writes Halliday, Greek Divination, 258. The same writer says farther on (261) that birds play a part in the magical recall of spring and summer. The Rhodian swallow-song does speak of the swallow as bringing the spring⁶¹, and a passage from the Latin Anthology, quoted above, does invoke the cuckoo to dispel the cold. That these illustrations may be taken literally is shown by a Russian parallel: "On the 25th of < March > the swallow comes flying from Paradise, and brings with it warmth to the earth"⁶².

It would probably be quite wrong, however, for one to infer from this that the origin of seasonal weather lore of birds is due to any belief in their magical ability to cause or to import the seasons. Unsophisticated man could hardly have understood that the reappearance of the swallow, for instance, was an arrival from another clime.

It is reasonable to suppose that when Aristotle, Historia Animalium 8.16, names some ten species of birds which he thought hibernated⁶³, he is defending a time-honored idea for the total rejection of which he believed there was not sufficient evidence. The tradition of hibernation persists in Latin literature and even in modern times⁶⁴. The appearance and the disappearance of birds would early be associated with the seasons, but responsibility for bringing them would hardly be thrust upon the birds as long as belief in hibernation was prevalent. Plants and flowers, which are dormant in winter, are likewise harbingers of seasons, but nowhere, so far as I know, are they endowed with power to bring them. It would seem, then, that the idea of the sponsorship of the birds for the seasons, if it ever attained much credence, is later than their reputation as *nomenclatores* of seasons.

UNIVERSITY OF MICHIGAN EUGENE S. MCCARTNEY

⁶¹Cowley, The Swallow, quotes mankind in general as saying of the swallow, 'Thou bring'st the spring'.

⁶²W. R. S. Ralston, The Songs of the Russian People, 213.

⁶³Compare also Aristotle, De Mirabilibus Auscultationibus 63.

⁶⁴Martin, The Birds of the Latin Poets, 232-233; Halliday, Greek Divination, 260-261.



Magic and the Weather in Classical Antiquity

Author(s): Eugene S. McCartney

Source: *The Classical Weekly*, Vol. 18, No. 20 (Mar. 30, 1925), pp. 154-157

Published by: [Classical Association of the Atlantic States](#)

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University Press, 1919. Pp. vii + 97.—Thomas D. Goodell, C. W. 13.176.

201. Wing, Herbert: *Tribute Assessments in the Athenian Empire* (Wisconsin, 1915). Washington, D. C., Government Printing Office, 1919. Reprinted from the Annual Report of the American Historical Association for 1916, Volume 1, 287-297.

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CHARLES KNAPP

MAGIC AND THE WEATHER IN CLASSICAL ANTIQUITY

In lieu of other subjects, investigators, like conversationalists, may talk about the weather¹. As Mark Twain says, "The weather is necessary to a narrative of human experience".

In antiquity, efficient methods had not been devised for storing up in great quantities the excess production of fruits and crops of one year to tide over a possible failure of the next harvests. The food-reserve must have been small, in spite of the existence of such magazines as one may still see in Crete and at Ostia. A shortage in one locality could not always be readily remedied from another. People lived somewhat of a hand-to-mouth existence at times. The reflex of poor crops was not long in making itself felt. Again, in contrast to modern civilization, which has almost freed itself from dependence upon the wind, the ancients needed this element in winnowing as well as in sailing their craft. It will thus be seen that the weather had an intimate relation day by day with the occupations and the welfare of a far larger proportion of people than it does at the present time. One of the problems of antiquity was, therefore, to secure the kind of weather needed and to avert the other. Numerous efforts were made to control the elements.

This paper may have some incidental interest in view of Sir James G. Frazer's theory of the evolution of kings from magicians. According to this theory, a reputation for ability to control the weather played no small part in elevating a man above his fellows².

PRAYER

While efforts to influence the weather by prayer and sacrifice are in general not to be regarded as magic³,

¹Other studies of weather lore by the author to be found in THE CLASSICAL WEEKLY are An Animal Weather Bureau, 14.89-93, 97-100; The Folk Calendar of Times and Seasons, 16.3-7; The Plant Almanac and Weather Bureau, 17.105-108.

²Lectures on the Early History of the Kingship, 92-106 (London, 1905).

³Compare Frazer on Pausanias 2.12.1: "Attempts like these to appease the wind by sacrifice and prayer should be distinguished from attempts to subdue it by force or magic".

a few comments upon these supernatural aspects of weather lore make a fitting introduction to the magical side. Occasionally, however, prayers must have been closely related to incantations, as indeed are some prayers which it is still possible to hear. The very expression, *ignem divinum precibus eliciebant*⁴, breathes an atmosphere of magic.

Zeus was of course the chief object of devotion, since he was the god of lightning, thunder, the thunderbolt, rain, and clear weather⁵. He was the wind, the cloud, the rain, the cold, the air⁶.

Pausanias (1.24.3) saw in the Parthenon an image of Earth praying to Zeus to rain on her, 'either because the Athenians themselves needed rain, or because the drought was over all Greece'. Meditative Marcus Aurelius⁷ records for us a rain-prayer of the Athenians, the simple beauty of which he thought worthy of imitation: 'Rain, rain, dear Zeus, upon the ploughed fields of the Athenians and on the plains'.

Deities other than Zeus were invoked for rain. When Croesus upon the funeral pyre learned that Cyrus intended to save him, but that orders were being carried out too slowly, he prayed to Apollo to send a cloud and storm and to cause a rain violent enough to extinguish the flames⁸. As part of a ceremony for rain, prayers were offered to the nymph of the spring on Mt. Lycaeus in Arcadia⁹. In Orphic Hymn 82 prayer is made to Notus for rain, but it is recognized that he takes orders from Zeus. Notus is the wind that Zeus employs to bring on the rain for the deluge¹⁰. In Orphic Hymn 19 the clouds are invoked to send rain. Latin writers too show us that their fellow-countrymen prayed for rain¹¹.

The following simple epigram is representative, perhaps, of the general belief in divine control of the weather: 'Eudemus dedicates this shrine in the fields to Zephyrus, most bountiful of the winds, who came to aid him at his prayer that he might right quickly winnow the grain from the ripe ears'¹². Akin to this in spirit are entreaties to Zeus to send winds to entangle quail in meshes¹³.

The country of Mothone was subject at one time to strong and unseasonable winds, but from the day that Diomedes prayed to Athena the land suffered no injury from them¹⁴. Achilles prayed to the winds Boreas and Zephyr¹⁵. Etesian winds blew, on the invocation of Aristaetus¹⁶.

Prayers to or for certain winds are common in the

⁴Servius, on Aeneid 12.200.

⁵Apuleius, De Mundo, page 371. For Zeus as a weather god, see Folk-Lore, 15.266-268; for Jupiter in the same capacity, see *ibidem*, 16.263-271. See also the handbooks of religion, by O. Gruppe, Griechische Mythologie und Religionsgeschichte (Munich, 1906); L. R. Farnell, The Cults of the Greek States (Oxford, 1896-1909); Preller-Jordan, Römische Mythologie (Berlin, 1881). This conception of Zeus has inspired in more modern times an amusing play by John Heywood, called Play of the Wether.

⁶Ennius, in Varro, De Lingua Latina 5.65. ⁷Ad Se Ipsum 5.7.

⁸Herodotus 1.87. There is in the British Museum a vase-painting showing Alcmena upon a pyre. One hand is upraised, perhaps in supplication. To one side Zeus is represented as causing rain to be sent (see Müller, Archäologie der Kunst, Atlas, Plate XIV d, Fig. 5).

⁹Pausanias 8.38.4. ¹⁰Ovid, Met. 1.264.

¹¹Vergil, Georgica 1.157; Horace, Epp. 2.1.132-135, Carmen Saeculare 31-32; Ovid, Fasti 1.682.

¹²Greek Anthology 6.53 (Mackail's translation).

¹³Callimachus, Aitia 3.1 (Mair's edition, page 309).

¹⁴Pausanias 4.35.8. ¹⁵Iliad 23.194-195.

¹⁶Scholium ad Apollonium Rhodium 1.498.

Orphic Hymns. Tethys is invoked to send blasts favorable for certain ships (22)¹⁷; Zephyr is likewise entreated (81)¹⁸; Leucothea is urged to lavish breezes favorable for her priests at sea (74)¹⁹; Boreas is asked to drive away the rain-clouds and to make the heavens clear²⁰. The *aether* also is entreated for clear weather (5)²¹.

The highly scientific Lucretius²² knew that the skipper's prayer for the calming of the winds and the return of clear weather was a futile proceeding²³. Efforts were made to avert even thunderbolts by prayer²⁴.

SACRIFICE

By offerings, too, the ancients tried to persuade the gods to send the kind of weather desired. It would seem that sacrifice as well as prayer had magical elements in it. In the Agamemnon (1417-1418) Aeschylus does in fact tell us that the slain Iphigenia was a 'charm' against the Thracian winds. One would naturally suppose also that the sacrificial ceremonies would contain certain magical gestures and formulae.

The fact that thrifty peasants were willing to offer up healthy animals in sacrifice shows how implicit was their belief in the efficacy of the act. The most vivid picture we have of sacrifice for rain is worth quoting in full²⁵:

'A drought is upon us. Nowhere is there a cloud hanging over the earth. We need a deluge. That the ploughed fields are thirsty the parched earth shows. Vain and unnoticed, it appears, are our sacrifices to Jupiter Pluvius. And yet all of us villagers engaged in rivalry to have a sacrifice with favorable omens and all of us contributed to the best of our ability, one a ram, another a goat, another a boar, the poor man a cake, the really poor man lumps of mouldy incense, but no one a bull. For we who live on the thin soil of Attica do not have a supply of fat cattle. But there is no aid from the expenditure, for it seems that Zeus is among other nations and is not concerned about things here'.

By sacrifice Aristaeus delivered the island of Cos from a protracted drought and pestilence²⁶, an event that is commemorated on the coins of the island by the head of the deified Aristaeus and by a figure of Sirius²⁷, at whose rising the etesian winds blew.

We learn from Pausanias (9.39.4) that there was an image of Rainy Zeus in the open air at Lebadea. By the same authority we are informed that there were altars to this god at Argos (2.19.8), on Mt. Hymettus

(1.32.2), on Mt. Panhellenius (2.29.7-8²⁸, 2.30.4), and on Mt. Arachnaeus (2.25.10). At these places sacrifices were offered with varying ceremonies. From inscriptional evidence we know that in Cos formal processions by religious bodies preceded the sacrifices²⁹. In Rome, too, in time of drought women went in procession³⁰ to the Capitol with bare feet and dishevelled hair, praying to Jupiter for rain³¹.

When Xerxes was marching against Greece, an oracle advised that prayers be made to the winds that they might become allies of the Greeks. Accordingly, the Delphians set up altars to the winds and sacrificed to them. At the time Herodotus was writing, it was still the custom to propitiate the winds³². The Persian Magi too made offerings to the winds³³. When a violent storm destroyed not fewer than four hundred Persian vessels³⁴, the Athenians thought that their prayers had been answered, and so in gratitude erected a sanctuary to the North Wind, beside the Ilissus³⁵. They seem to have held festivities in honor of the North Wind and to have offered him banquets³⁶. A heifer might be sacrificed to the blustering winds³⁷. There are a great many instances of sacrifices of one kind or another to the winds³⁸.

Lightning, too, was propitiated by sacrifice. To the northwest of Athens there was a lofty peak called Harma on which was an altar to Lightning Zeus³⁹. When the Pythaists amid their vigil⁴⁰ beside the altar of Zeus Astrapaeos in Athens saw lightning⁴¹ over Harma, they sent a sacrifice to Delphi⁴². At Olympia there was an altar to Thunderbolt Zeus, which was supposed to commemorate the striking of the house of Oenomaus⁴³. Sacrifices were made at Bathos to lightning, thunder, and hurricanes⁴⁴. If one did not have a lamb or a chicken to sacrifice to the hail-clouds, an effective substitute was blood pricked from a finger⁴⁵.

Ovid⁴⁶ tells us that a temple was dedicated to Tempestas by a Scipio⁴⁷. There was an altar on the Quirinal to Jupiter Fulgurator⁴⁸, and one on the Aventine to Jupiter Elicius⁴⁹.

WEATHER-MAKERS AND MAGICIANS

In the pages of our first Greek writer, Homer,

²⁸Compare Isocrates, Evagoras 5.14; Apollodorus, Bibliotheca 3.12.6; Pausanias 1.44.9.

²⁹Paton and Hicks, The Inscriptions of Cos, No. 382 (Oxford, 1891); O. Lüders, Die Dionysischen Künstler, 165 (Oxford, 1891).

³⁰Fowler, The Religious Experience of the Roman People, 64 (Macmillan, London, 1911), thinks that the procession is a Greek element.

³¹Petronius 44; Tertullian, Apologeticus 40, De Ieiunio 16.

³²Herodotus 7.178. ³³Herodotus 7.191.

³⁴For a somewhat similar incident when the North Wind saved the Megalopolitans, see Pausanias 8.27.14, 8.36.6. The Cyziceni too were aided by the wind (Plutarch, Lucullus 10). When the Spanish Armada was destroyed, many people in England attributed the storm to the intervention of the Deity.

³⁵Herodotus 7.189. Compare Aelian, Varia Historia 12.61.

³⁶Hesychius, s. v. Boreasmoi. Compare the Athenian sacrifice to the seasons (Athenaeus 14.72).

³⁷Lycophron, Alexandra 183-184. Compare Vergil, Aeneid 5.772; Horace, Epode 10.24.

³⁸See Stengel, Die Opfer der Hellenen an die Winde, Hermes 16.346-350; Frazer on Pausanias 1.19.5, 2.12.1. See also Stengel, Der Cult der Winde, Hermes 35.627-635, and Preller-Jordan, Römische Mythologie, 1.329-331 (Berlin, 1881).

³⁹Bekker, Anecdota Graeca 1.212. ⁴⁰This lasted for three days and three nights in each of three successive months (Strabo 9, page 404).

⁴¹The flashes of lightning were called 'Pythian' (Euripides, Ion 285).

⁴²Strabo 9, page 404. ⁴³Pausanias 5.14.7. ⁴⁴Pausanias 8.29.1.

⁴⁵Seneca, Naturales Quaestiones 4.6.2, 4.7. ⁴⁶Pasti 6.193.

⁴⁷Compare the Corpus Inscriptionum Latinarum, 6, No. 1287.

⁴⁸Ibidem, 6, No. 377. ⁴⁹Varro, De Lingua Latina 6.94.

¹⁷Compare Vergil, Aeneid 5.59-60; Diodorus 4.43.1-2; Aethiops 15.18.

¹⁸Compare Greek Anthology 12.171; Ovid, Amores 2.11.37-42; Claudian 12.41-45 (Fescennia De Nuptiis Honori Augusti).

¹⁹Contrast Horace, Epode 10, where the elements are invoked to destroy Mevius at Sea. Prayer was made to Isis amid storms at Sea (Tibullus 1.3.28).

²⁰Compare Ovid, Fasti 1.681.

²¹On prayer and the weather, see pages 83-94 of the article by Morris H. Morgan, Rain Gods and Rain-Charms, Transactions of the American Philological Association 32.83-109.

²²5.1226-1232.

²³See other instances cited by W. H. D. Rouse, Greek Votive Offerings 230 (Cambridge, 1902).

²⁴Geoponica 1.12.37. Compare Seneca, Hercules Oetaeus 467-480.

²⁵Alciphron, Epp. 3.35. Compare Ovid, Ibis 397-398.

²⁶Diodorus 4.82.1-3; Apollonius Rhodius 2.516-527; Clemens Alexandrinus, Stromata 6, page 630; Callimachus, Aitia 3.1 (Mair's edition, page 209). Compare also Lycophron, Alexandra 159-160 (Mair's edition, page 508); Apollodorus, Bibliotheca 2.5.11; and Ellis's note on Ovid, Ibis 397.

²⁷Head, Historia Nummorum, 411 (Oxford, 1887).

magical weather lore is already well established. Jove's aegis when shaken produced a thunderstorm⁵⁰. The Hours, to whom was entrusted the guardianship of the gates of Olympus, were able to shut up the thick cloud or to send it forth⁵¹.

To assist Ulysses, his host Aeolus bound the courses of the blustering winds in an ox-skin sack tied with a bright silver cord, gave it to the hero, and then sent a favoring Zephyr⁵². In Odyssey 10.21 Aeolus has merely a mandate over the winds; in Aeneid 1.50-63 Jupiter has made him *rex ventorum*⁵³. There were attempts to explain the story of the control of the winds by Aeolus. According to Diodorus (5.7.7), Aeolus was a petty king who, because of his ability to read in the fire signs of winds that were to come, was finally regarded as the ruler of the winds. It was said too that some people could tell from the smoke of Stromboli three days in advance what winds were going to blow. Since the home of Aeolus was in this region, the notion arose, if we may believe Pliny⁵⁴, that the winds were governed by him.

Several gods and magicians of the Odyssey were able to direct the winds or even to cause storms, among them Athena⁵⁵, Poseidon⁵⁶, Calypso⁵⁷, and Circe⁵⁸. In the Iliad, Hera stirs up squalls upon the boisterous main⁵⁹; Apollo sends a favorable breeze⁶⁰.

Though there are many references to prayers for winds favorable to navigation, weather-makers seem more concerned about subduing the winds than in causing them. Rhea was able to avert hurricanes⁶¹. On one occasion, when it had stormed three days, the Magi in the army of Xerxes endeavored to allay the wind by enchantments⁶². There were magicians at Corinth who claimed to be able to calm the winds⁶³. The priestess Oenothea also could allay them⁶⁴.

Even the philosopher Empedocles professed *inter alia* power to allay fierce winds or to stir up blasts, to cause rain or to stop it⁶⁵. One of his methods of allaying the winds is so ridiculous that one almost suspects him of having played a practical joke. When the etesian winds were blowing so viciously as to be destructive of crops, he ordered that asses be flayed and that from their hides sacks should be made and stretched toward the hills so as to catch the winds⁶⁶. His success earned for him the name 'Wind-Stopper'⁶⁷. Empedocles is

said likewise to have stopped a cloud that was bearing down upon Agrigentum⁶⁸.

Simonides composed a song to the winds. When they heard it sung at sea, they would submissively follow the song, and, blowing upon the stern of the ship, would help it onward in its course⁶⁹. Sophocles, the Athenian, calmed winds that blew out of season⁷⁰.

Because of lack of favorable winds, grain transports in the Mediterranean could not reach Constantinople on one occasion during the reign of Constantine. Enraged by the belief that a wise man named Sopater had bound the favorable blasts, the populace held an indignation meeting and persuaded the Emperor to give orders for him to be killed⁷¹. In order to keep the wind away some magicians were wont to cut up and burn the *silurus*, a large fish⁷².

The Cretan Telchines could summon clouds, hail, rain, or snow⁷³. Not less versatile was the sorceress Medea. She could cause or dispel clouds and winds, summon snows, and doubtless control the elements in other ways⁷⁴. There was an old woman named Dipsas who was familiar with Aeaeon incantations. At her will the entire expanse of the heavens would be clouded, or the day would be bright and clear⁷⁵. With incantation Circe, too, could weave moisture-laden clouds beneath the heavens⁷⁶. Neptune could dispel them⁷⁷.

Nephele, the mother of the Centaurs, poured forth a heavy rain in order to aid them against Heracles⁷⁸. Merely with their voices Thessalian enchantresses could bring clouds and rain, and even thunder, without the permission of Jove. Likewise, they could lull a storm⁷⁹. When a demon or demigod died in some of the islets about Britain, great storms and tempests would arise⁸⁰.

Part of an epigram on the bard Orpheus reads: 'No more shalt thou lull to sleep the howling winds and the hail and the drifting snow and the roaring sea'⁸¹.

When the people of Crannon in Thessaly desired a rain-fall, they shook a large bronze chariot which they kept in a temple⁸². The badge of this people consisted of two crows perched on chariot wheels⁸³. Servius⁸⁴ explains Prometheus's theft of fire by saying that he taught man to draw down the lightning.

The Etruscans had an outstanding reputation as meteorologists⁸⁵. They were especially versed in the ways of Jupiter Fulminator. Tarchon protected his fields from thunderbolts by surrounding them with white vines; Tages employed the head of an ass against evils in general⁸⁶. Etruscans used incantations to cause

⁵⁰Iliad 17.593-596. Compare 4.166-168; Vergil, Aen. 8.352-354; Silius Italicus 12.719-724.

⁵¹Iliad 5.749-751. ⁵²Odyssey 10.19-26. In India winds and rain were kept under control in jars (Philostratus, Apollonius of Tyana 3.14).

⁵³See also Ovid, Met. 4.663, 11.747-748. For a modern feminine Aeolus, see John Biggs, Jr., The Wind Witch, Scribner's Magazine, 71.343-354. In Scott, The Pirate, Chapter 7, "the mistress of the potent spell" could "change the wind by pulling her curch on one side, as King Erick used to do by turning his cap".

⁵⁴Pliny, N. H. 3.94. ⁵⁵2.420, 5.109, 382-385, 15.202. ⁵⁶4.500, 5.291-294, 7.272, 9.283, 11.400, 407, 24.109. See too Iliad 9.362, and Vergil, Aen. 1.131-134, 4.223.

⁵⁷5.268, 7.266. ⁵⁸11.7, 12.149. ⁵⁹15.26-27. ⁶⁰1.479. ⁶¹Apollonius Rhodius 1.1092-1100, 1132-1134, 1151-1152. Elsewhere Rhea is said to be the cause of rains. See Cornutus, Theologiae Graecae Compendium, Chapter 6.

⁶²Herodotus 7.191. ⁶³Hesychius, s. v. Anemokoitai. ⁶⁴Petronius 134. See also Apuleius, Apologia 3.10; Geoponica 5.33-7.

⁶⁵Diogenes Laertius 4.59. ⁶⁶The recollection of Ulysses's bag of winds may have made this seem more plausible. ⁶⁷Diogenes Laertius, Empedocles 5.60. See also Hesychius, s. v. Kolusamenas. Compare too Clemens Alexandrinus, Stromata 6.30, page 754.

⁶⁸Philostratus, Epistolae 8.7.8.

⁶⁹Himerius, Oratio 5.60. See also Bergk, Poetae Lyrici Graeci, 3.397. Compare stories about Orpheus, Greek Anthology 7.8; Horace, Carm. 1.12.7-10.

⁷⁰Philostratus, Epistolae 8.7.8. ⁷¹Eunapius, Vitae Sophistarum 41. ⁷²Geoponica 5.33-7.

⁷³Diodorus 5.55.3. Compare 5.56.1-2. ⁷⁴Ovid, Met. 7.201-202, 424; Tibullus 1.2.49-50; Valerius Flaccus, Argonautica 8.351; Pausanias 2.12.1.

⁷⁵Ovid, Amores 1.8.9. ⁷⁶Ovid, Met. 14.368-369. ⁷⁷Vergil, Aen. 1.140. ⁷⁸Diodorus 4.12.6. ⁷⁹Lucan, Pharsalia 6.465-468. ⁸⁰Plutarch, Moralia 419 E-F. ⁸¹Greek Anthology 7.8.

⁸²Antigonius, Historia Mirabilium 15. ⁸³For an illustration, see Jane Harrison, Themis, 81 (Cambridge, 1912).

⁸⁴On Eclogue 6.42. ⁸⁵See K. O. Müller, Die Etrusker 176-180 (Stuttgart, 1877). ⁸⁶Columella 10.344-347.

as well as to avert thunderbolts⁸⁷. When Alaric was assailing Rome in 408 A. D., Pope Innocent summoned Etruscan diviners to repeat their feats of terrifying barbarians by bringing thunderbolts upon them⁸⁸. Tullius Hostilius was struck by lightning when he made a mistake in the ceremony of drawing down Jove⁸⁹. Lightning was invoked against a monster which had ravaged the territory around Volsinii⁹⁰. So great was the reputation of the Etruscans as masters of the lightning that some scholars of a former day seriously asked whether they did not anticipate Franklin⁹¹. From them the Roman farmers learned how to quiet the winds and to turn aside storms⁹².

The immersion in the Tiber of the Argei or puppets has been explained as a rain-spell⁹³. At Sena Insula, an island off the coast of the Osismii in Gaul, there was an oracle of a Gallic goddess. Nine virgins named Gallicenae⁹⁴, who had charge of the oracle, could raise storms by their verses⁹⁵. Pliny⁹⁶ speaks of Magi who asserted that they could avert hail.

There were demons who were able to give advance information of storms, thanks to their habitations amid the clouds and near the stars⁹⁷. Tertullian⁹⁸ mentions a *virgo caelestis, pluviarum pollicitatrix*. From the Codex Theodosianus (9.16.5) we learn that in the time of Constantine there were many persons who sought to disturb the elements⁹⁹. When provision was made to punish those who practised magic arts, an exception was made of persons who were really trying to benefit mankind by turning aside rain and hail from the ripe crops in the vineyards (9.16.3).

Even the seas were subject to magical control. Medea could arouse the waves¹⁰⁰. The Gallicenae had similar power¹⁰¹. Amid the raging of Notus Thessalian maidens forbade the waters to feel the squalls¹⁰². One will recall how Christ calmed the sea of Galilee: "But the men marvelled, saying, 'What manner of man is this, that even the winds and the sea obey him?'"¹⁰³ In Apuleius¹⁰⁴ one speaker regards as preposterous the idea that winds can be lulled by magic whispering, or that a boisterous sea can be stilled.

In addition to passages which link the use of incantations to definite names, there are some general references to their employment. Pliny¹⁰⁵ notes the existence of incantations against hail, but refuses to set down the words. In the Geoponica (1.14.11) they are thought highly improper. Seneca¹⁰⁶ speaks rather patronizingly of 'antiquity' for believing that rain could be attracted or repelled by them. We have

noted that thunder too could be caused or prevented in this manner¹⁰⁷.

Zeus does not seem to have been a very jealous god, for no weather-makers were punished for assuming his prerogatives except those who tried to imitate thunder and lightning. The thunderbolt was the great instrument of divine vengeance¹⁰⁸. Athena, however, was allowed to wield it. She boasted that she alone knew the keys of the chambers of the thunderbolt¹⁰⁹. She used this weapon to kill Ajax¹¹⁰.

For imitating lightning by torches thrown skyward and thunder by driving chariots over a bronze bridge, Salmoneus was doomed to cruel punishments in Hades¹¹¹. Dionysius¹¹² records for us the fate of Allodius, an Alban king whom the gods hated. Scorning the divine powers, he imitated thunder and lightning with the idea of terrifying mankind into the belief that he himself was a god. To punish him, tempests and thunderbolts crashed down upon his dwelling, the Alban Lake rose to an unwonted height, and he himself was overwhelmed with all his house. Whenever the depths of the lake were undisturbed, the ruins of porticoes and other traces of a dwelling were visible¹¹³.

Deities other than Jove might, like Jehovah of the Hebrews, use the weather to punish impiety. On one occasion an Athenian named Stratocles decreed that Demetrius on visiting Athens should be received with the same divine honors that were paid to Demeter and Dionysus. This and other acts of sacrilege aroused the displeasure of the gods. 'On the day of the festival of Dionysus the procession was stopped by excessive cold, which came entirely out of season, and a severe frost not only destroyed all the fig trees and vines, but even cut off a great part of the grain in the blade'¹¹⁴.

In Petronius¹¹⁵ the fields are represented as suffering because the people are no longer devout. Aristophanes¹¹⁶ playfully pictures the clouds as threatening to requite disrespect by destroying grain, grapes, and olives with hail.

(To be Concluded)

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EUGENE S. MCCARTNEY

A MODERN CANNAE¹

Teachers whose pupils find Caesar dull can inject new life into the work if they will compare modern

⁸⁷Pliny, N. H. 2.140. ⁸⁸Zosimus 5.41. ⁸⁹Pliny, N. H. 2.140, 28.13-14. See also Livy 1.31.8. ⁹⁰Pliny, N. H. 2.140.

⁹¹For comment and bibliography, see Daremberg et Saglio, Dictionnaire des Antiquités Grecques et Romaines, s. v. Fulmen, page 1357, note 7.

⁹²Columella 10.339-341. ⁹³Powder, Roman Festivals, 119 (London, 1899).

⁹⁴There is also a reading *Barrigenae*. ⁹⁵Pomponius Mela 3.6. ⁹⁶Pliny, N. H. 37.124.

⁹⁷Tertullian, Apologeticus 22. ⁹⁸Apologeticus 23. ⁹⁹Compare Codex Justinianus 9.18.6. ¹⁰⁰Valerius Flaccus 8.352. ¹⁰¹Pomponius Mela 3.6.

¹⁰²Lucan, Pharsalia 6.469-471. Compare Vergil, Aen. 1.135; Ovid, Met. 7.153-154; Cicero, De Natura Deorum 3.20; Petronius 134, ad finem.

¹⁰³Matthew 8.27. ¹⁰⁴Metamorphoses 1.3. ¹⁰⁵N. H. 17.267, 28.29. ¹⁰⁶Naturales Quaestiones 4.7.2.

¹⁰⁷Pliny, N. H. 2.140. For late instances of weather-making see Du Cange, Glossarium Mediae et Infimae Latinitatis, s. v. Tempestarii.

¹⁰⁸E. g. Horace, Epp. 1.3.39-40. ¹⁰⁹Aeschylus, Eumenides 830-831. There were, however, other deities who occasionally wielded the bolt.

¹¹⁰Vergil, Aen. 1.40, 11.260; Hyginus, Fabulae 116. ¹¹¹Vergil, Aen. 6.585; Valerius Flaccus 1.662; Hyginus, Fabulae 61, 250; Apollodorus, Bibliotheca 1.9.7.

¹¹²Antiquitates Romanae 1.71. ¹¹³For other references to this story and for a discussion of it, see K. F. Smith, On a Legend of the Alban Lake Told by Dionysius of Halicarnassus, American Journal of Philology 16.203-210.

¹¹⁴Plutarch, Demetrius 12. On the use of the elements to punish man, see Hesiod, Fragments 125 (109); Aeschylus, Septem in Thebas 440; Aristophanes, Nubes 339; Apollodorus, Bibliotheca 1.7.2, 3.8.1; Plutarch, Sulla 14.7, Lucullus 24.5; Quintus Smyrnaeus 8.70-73; Horace, Epp. 1.3.39-40; Livy 8.6; Tacitus, Annales 13.41.4-5, 16.13.1; Appian, De Rebus Illyricis 4. Alexander was assisted by a heaven-sent rain (Plutarch, Alexander 27).

¹¹⁵44, ad finem. ¹¹⁶Nubes 1121-1125.

¹This paper was received after Colonel Spaulding's article, The Classical Element in the German War Plan of 1914, THE CLASSICAL WEEKLY 18.142-143, had been sent to the printer. The reader may be reminded that, under the caption War, The



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Author(s): Eugene S. McCartney

Reviewed work(s):

Source: *The Classical Journal*, Vol. 21, No. 2 (Nov., 1925), pp. 112-131

Published by: [The Classical Association of the Middle West and South](#)

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THE "WOODEN HORSE" AND FOLK-LORE OF TOUCHING

By EUGENE S. MCCARTNEY
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There is more folk-lore (religion, if you will) connected with Vergil's story of the "wooden horse" than is generally realized. According to Sinon, the horse was a substitute for the statue of Pallas Athena, which had been carried away. The Trojans believed Sinon's tale; in their eyes it was Athena by proxy.¹ Since possession of it would, therefore, again ensure the salvation of the city, it falls into the category of talismans on the preservation of which the salvation of cities or individuals depends.²

The stopping of the horse, an act which would have been a bad omen in any procession,³ was especially ominous when it occurred at the gateway.⁴ The apprehension of the Trojans was increased by the fourfold repetition of the act.⁵

The introduction of the horse into the city was not a mere act of drayage or transportation. It was a ceremony. It was not by chance that boys and unmarried girls were touching the rope that stretched from it. They had been ceremonially chosen. According to Servius,⁶ they were *matrimi* and *patrimi*, as indeed were the boys who took part in the rites of the Arval Brethren and in religious festivals in general. The touching of the rope was a meaningful act, as I hope to show by many and varied examples of popular ideas connected with the act of touching.

¹ Verg., *Aen.*, 2. 183-184.

² Compare Frazer, *Pausanias*, IV. 433-434.

³ See McCartney, the *CLASSICAL JOURNAL*, 19. 316. The stopping of a pantomimist or a flute-player during a ceremony was likewise a bad portent. See Cic., *De Harusp. Resp.*, 23.

⁴ See Ogle, *American Journal of Philology*, 32. 251-254; McCartney, the *Classical Weekly*, 13. 217.

⁵ Lease, the *CLASSICAL JOURNAL*, 19. 447-448.

⁶ *Ad Aen.*, 2. 238.

There were many ways of getting "in touch" with things divine or supernatural. Miraculous powers were ascribed to numerous objects suspended from, or attached to a person⁷ or carried or worn in other ways.⁸ The method of effecting the connection might change, but the principle was the same, that of contact.⁹ In this paper I wish to confine myself to the act or art of touching.

The use of the hand is most frequently mentioned or implied in this operation. It must be remembered that the hand was the symbol of strength and authority.¹⁰ When the emissary of Appius Claudius wished to seize Virginia, he called her a daughter of a slave and a slave herself, and then, laying his hand upon her, he bade her follow him.¹¹ The Latin words to express the release of a slave from authority, *emancipatio* and *manumissio*, both contain the Latin word for "hand." It is entirely natural that these ideas should gather about the hand, since the more primitive the society, the more frequent is the use of the hand in the exercise of strength and in the enforcement of one's wishes. A reminiscence of an older order of things is to be seen, perhaps, in the *manus iniectio*, which indicated that a Roman had authority to hale a man before the praetor.¹² In much the same way rods or fasces became merely symbols of power.¹³

⁷ E.g., Pliny, *Nat. Hist.*, 20. 215, tells how a man wore the root of a plant suspended from his neck because of severe pains of the uvula. See also Migne, *Patrol. Lat.*, 39. 2272: *Si illum praecantatorem adhibuisses, iam sanus esses; si characteres illos tibi voluisses appendere, iam poteras sanitatem recipere.*

⁸ Damigeron, *De Lapidibus*, gives many instances of the carrying of magical stones and gems. The carrying of plants or parts of animals as remedies is frequently advocated by Pliny.

⁹ See Hartland, *Ritual and Belief*, pp. 33-34. This reference should be starred.

¹⁰ Hastings, *Encyclopaedia of Religion and Ethics*, s. vv. hand, faith-healing; Daremberg et Saglio, *Dictionnaire des Antiquités Grecques et Romaines*, s. vv. *manus*, *manus iniectio*; Sittl, *Die Gebärden der Griechen und Römer*, pp. 129 ff.

¹¹ Livy, 3. 44. 6; cf. Dionys., 11. 28.

¹² See Daremberg et Saglio, *op. cit.*, s. v. *manus iniectio*.

¹³ Cf. Serv. *ad Aen.*, 4. 242: *Virga vero insigne potestatis est, nam ideo ea et magistratus utuntur.*

In trying to find an analogy for the way the evil eye works merely by a glance or a look, Plutarch¹⁴ says that there is obviously some basis for the effects produced by touching and handling. Without finding what it is, he adds that one man's touch may be good and advantageous and another's hurtful and destructive.

GENERAL INSTANCES OF MAGICAL TOUCHING

There are several interesting beliefs about trees and touching. So potent is the hand that trees which have the strength of years succumb more quickly if they are touched by it before the axe is plied.¹⁵ A wedge that has been driven home into a tree by shepherds will leap out with agility if it is touched by a certain herb carried by a bird. This is asserted on good authority, says Pliny (25. 14). Trees may be protected from caterpillars and saved from rotting if their tops are touched by the bile of a green lizard.¹⁶

If one wishes to release a culprit who has been thrown into chains he should touch them with the *lapis Syrtius* and they will forthwith be broken. One should then go to the gate and touch it with the stone, whereupon it will open, and the prisoner may go where he wills, seen by no one.¹⁷ Should one happen to have a consecrated *lapis lychnites* in a house that is burning, all he has to do to extinguish the fire at once is to touch the house with it.¹⁸ The salamander, too, can put out a fire by contact.¹⁹

Merely by a finger-touch Zeus begot by Io a child named Epa-

¹⁴ *Mor.*, 680 F.

¹⁵ Pliny, *Nat. Hist.*, 24. 2.

¹⁶ Pliny, 17. 266: cf. *Pallad.*, 3. 25. 15; *Geopon.*, 10. 18. 7.

¹⁷ Damigeron, *De Lapidibus*, 22 (p. 181, ed. Abel).

¹⁸ *Op. cit.*, 28 (p. 184, ed. Abel).

¹⁹ Pliny, 10. 188 (cf. 29. 76): *Huic tantus rigor ut ignem tactu restinguat non alio modo quam glacies*. The Latin shows that this is 'sympathetic' magic. The rigidity of the animal's body causes a similar stiffness in the flames, i. e., it extinguishes them. Compare the somewhat similar instance in which the touching of the pregnant body of Semele, who was possessed by a god, could cause one to become possessed. — Schol. on Apoll. Rhod., 1. 636.

phus, "Touch-born."²⁰ On another occasion he changed her into a white cow by touching her.²¹

Touching door-posts with a branch of the strawberry-tree was a means of driving away witches.²² At times Roman brides touched them with wool²³ or anointed them with wolf grease,²⁴ or fat, especially of swine.²⁵ If door-posts were touched with the blood of a hyena²⁶ or with menstrual fluid,²⁷ the arts of the magicians were rendered of no avail.

The muses made everything blessed which they touched.²⁸ Eros, Pothos, Charis and other similar personifications conferred by their touch the qualities they represented.²⁹

Hercules could not vanquish Antæus as long as the giant maintained contact with the ground, a circumstance that caused it to be said that Earth was his mother.³⁰ The seat of memory, which was in the lower part of the ear, was touched by the Romans on giving testimony.³¹ To avoid retribution from Nemesis for imprudent remarks, the Romans applied the next to the little finger to the mouth (to moisten it with saliva), and then placed it on the seat of Nemesis, which was behind the right ear.³²

²⁰ Aesch., *Suppl.*, 312-314. For many other references, see Cook, *Zeus*, I. 438, note 10. A snake might enable a woman to conceive by touching her with its tail; see J. Baunack, *Inscriptionen aus dem Asklepeion zu Epidauros* (Leipzig, 1886), I. 80, 117. Among other peoples pregnancy was supposed to be caused by the scent or touch of flowers or herbs; see Hartland, *The Legend of Perseus*, I. 94-97.

²¹ Apollodorus, *Bibliotheca*, 2. 1. 3.

²² Ovid, *Fasti*, 6. 155-156.

²³ Pliny, 29. 30. This was done *ne quid mali medicamenti inferretur* (Pliny 28. 142).

²⁴ Pliny, 28. 142.

²⁵ Pliny, 28. 135.

²⁶ Pliny, 28. 104.

²⁷ Pliny, 28. 85.

²⁸ Theocr. 10. 25.

²⁹ See Headlam, *Herodas, the Mimes and Fragments*, pp. 358-359.

³⁰ Apollod., *Biblioth.*, 2. 5. 11. See too Ovid, *Ibis*, 394; Juvenal, 3. 89; Lucan, *Phars.*, 4. 598-600.

³¹ Pliny, 11. 251. See also McCartney, the *Classical Weekly*, 12. 28.

³² Pliny, 11. 251. See also Nicolson, *Harvard Studies in Classical Philology*, 8. 37-39.

Circe changed the companions of Ulysses into swine merely by touching them with her magic wand,³³ "really a conductor of the magician's *mana*."³⁴ By the aid of her wand and charms she made Picus a bird.³⁵ Both Circe and Medea could kill merely by the touch.³⁶ Through a touch of the wand Athena restored to Ulysses his youthful appearance.³⁷ Hermes used a wand to bring or take away sleep,³⁸ to unseal eyes closed in death,³⁹ to banish darkness⁴⁰ and also for other purposes.⁴¹

Stroking Neoptolemus three times by the hand was part of the ceremony employed by Ceres to confer immortality upon him.⁴² The golden touch of Midas has been familiar to everyone from childhood.⁴³

Salvum sit quod tango ("Safe be that which I touch"), "ejaculates Trimalchio⁴⁴ piously, to avoid possible evil consequences when he touches his friend's arm to illustrate where and how the unfortunate character in his story was touched by the witch."⁴⁵ After hearing Trimalchio's terrifying story, the revelers kiss (another form of touching) the table and pray that the witches may stay in their haunts when they return home from the banquet.⁴⁶

If anyone touched the necklace of Harmonia, which had been dropped into a fountain, the Sun was offended and a storm arose.^{47 48}

³³ *Odyss.*, 10. 238. Cf. 293, 319, 389; Ovid, *Met.*, 14. 278, 295, 300.

³⁴ K. F. Smith, Hastings, *Encyclopaedia of Religion and Ethics*, 8. 283.

³⁵ Verg., *Aen.*, 7. 189-191.

³⁶ Aelian, *De Nat. Anim.*, 1. 54.

³⁷ *Odyss.*, 16. 172.

³⁸ *Iliad*, 24. 343-344; *Odyss.*, 5. 47-48; Verg., *Aen.*, 4. 242-244; Ovid, *Met.*, 2. 735-736..

³⁹ Verg., *Aen.*, 4. 244.

⁴⁰ Sil. Ital., 3. 199.

⁴¹ *Hymn to Hermes*, 528-532; Horace, *Carm.*, 1. 10. 17-20; 1. 24. 16.

⁴² Ovid, *Fasti*, 4. 551.

⁴³ Ovid, *Met.*, 11. 102-103; Verg., *Ecl.*, 6. 13; Hyg., *Fab.*, 191.

⁴⁴ Petronius, 63.

⁴⁵ The explanation is K. F. Smith's *op. cit.*, p. 280.

⁴⁶ Petronius, 64.

⁴⁷ Myth. Vat., 2. 78.

⁴⁸ For other general beliefs about touching, see Pliny, 2. 115; 19. 180; 20. 4,

POPULAR MEDICINE

Popular medicine offered a wide and tempting field for the exercise of touching, as indeed it still does. Persons afflicted with warts might treat them on the first day of the moon by touching each one of them with a chickpea, after which the pease were to be tied up in a linen cloth and thrown behind the patients.⁴⁹ Scrofula and throat diseases might be cured by the touch of the hand of a person who had died a premature death, or by the back of the left hand of any corpse, provided it was of the same sex as the patient.⁵⁰ The precaution of touching the eyes thrice with water in which the feet had been washed saved a man from having inflammation of the eye or other ocular troubles.⁵¹ By the touch of an elephant's trunk headache was alleviated, but the remedy was more efficacious if the elephant happened to sneeze at the time.⁵² Since the home medicine chest did not contain an elephant, the quack giving the prescription was safe.

For pains in the feet Cato's famous prescription recommended that the sufferer while fasting should chant thrice nine times *Terra pestem teneto; Salus hic maneto* [*in meis pedibus*], and then touch the earth and expectorate.⁵³ There were people who professed to cure the bites of snakes merely by touching.⁵⁴ Epileptics might be cured if the big toes were stuck and blood therefrom applied to the forehead, or if they were touched by the thumb of the right hand of a virgin.⁵⁵ By their touch the

9, 25, 223, 261; 23. 12; 24. 22, 151, 167; 25. 14, 112, 113, 122; 26. 99; 27. 4, 6, 7; 28. 46, 78, 79, 80, 81, 118, 150; 29. 51; 30. 30, 47; 32. 14, 22; Suet., *Nero*, 1.

⁴⁹ Pliny, 22. 149: cf. Marcellus Emp., 34. 102. See also J. Hardy, "Wart and Wen Cures," *Folk-Lore Record*, 1 (1878), 216-228.

⁵⁰ Pliny, 28. 45.

⁵¹ Pliny, 28. 44.

⁵² Pliny, 28. 88.

⁵³ Varro, *Res. Rust.*, 1. 2. 27. If the affliction was gout, the remedy was doubtless effective.

⁵⁴ Strabo, 13. 1. 4; Pliny, 7. 13; 28. 30; Lucan, 9. 922-26.

⁵⁵ Pliny, 28. 43. The first part of this prescription is repeated in about the same form, along with another 'touching' cure for epilepsy, by Theodorus Priscianus, near the beginning of the fourth book of his *Rerum Medicarum*

Muses could cure even a person in the last stages of consumption.⁵⁶

Though in Cato's prescription the malady was to be transferred to the ground by contact, there were many recipes in which amulets or other curative agencies were supposed to lose all or part of their potency by contact with the ground or with iron.⁵⁷ The teeth which fell first from horses made dentition easier for infants when bound to them, but they were more effective if they did not touch the ground.⁵⁸ To prevent ulcers in the groin it was sufficient merely to have with one a twig or myrtle that had not touched the ground or iron.⁵⁹

Persons suffering from diseases of the spleen were healed through the touch of the big toe of the right foot of Pyrrhus.⁶⁰ As a god of healing Apollo effected cures merely by touching or striking.⁶¹

There is some slight classical analogy to the royal touch of the French and English sovereigns.⁶² A maimed man in Alexandria is reported to have begged the Emperor Vespasian to step upon him.⁶³ A blind man came from Pannonia and touched

Libri Quattuor. The second part of Pliny's prescription reads, *si virgo dextro pollice attingat*. . . . Since the expression *pollices pedum* has just preceded, I am not entirely sure that *pedis* is not to be supplied. I believe it preferable not to supply a genitive. An interesting passage in connection with Pliny's remark is Herodotus, I. 198.

⁵⁶ Theocr., 10. 24-25.

⁵⁷ Magical formulas containing prohibitions against the use of iron are evidently survivals of the bronze age, or at least show the influence of it. On touching the ground, see Pliny, 19. 142; 20. 6, 29, 38; 21. 147; 23. 137, 138, 163; 24. 12, 68; 25. 171; 27. 89; 28. 34, 41, 175, 211, 215, 258, 265; 29. 52, 131; 30. 22, 108, 123; Marc. Emp. 29. 35. On touching iron, see Pliny, 19. 177; 23. 163; 24. 68, 171, 172. See too Hippocrates, *The Sacred Disease*, chap. IV.

⁵⁸ Pliny, 28. 258.

⁵⁹ Pliny, 23. 163.

⁶⁰ Pliny, 7. 20; 28. 34.

⁶¹ For references, see Boisacq, *Dict. Etymol. de la Langue Grecque*, s. v. *παῖς*; Roscher, *Lexikon*, vol. 3, p. 1243; Lersch, *Apollon der Heilspender* (I have not seen the last named work).

⁶² Compare Frazer, *The Magic Art*, I (1917), p. 371, note 4.

⁶³ Tac., *Hist.*, 4. 81; Dio, 66. 8; cf. Suet., *Vesp.*, 7. Much to Vespasian's credit, he was highly doubtful at first about his ability to perform the miracle requested.

the Emperor Hadrian, who was suffering from a fever. At once he recovered his sight and the fever left Hadrian.⁶⁴ A blind woman's sight was restored when she kissed Hadrian's knee.^{65 66}

RELIGION

The religious life of the ancients was permeated with lore of touching. I shall begin with prohibitions against the act. The Flamen Dialis was not allowed to touch a corpse, or to touch (or name) goat and uncooked meat and ivy and beans.⁶⁷ When a horse was being immolated at a religious function in Rome, the flamen in charge of the sacrifice was not permitted to touch it. The bile of the horse was regarded as poisonous.⁶⁸

There were many things with which the ordinary mortal was not to come in contact. Places struck by thunder were not to be touched.⁶⁹ It was a particularly bold act to touch a corpse struck by the fire of Jove.⁷⁰ It was unlawful for any man to touch the sacred arms at Delphi.⁷¹ In the Life of Pythagoras by Diogenes Laertius⁷² we are told that a white cock was not to be touched (=eaten), because it was holy and had to do with suppliants. Likewise fish that were holy were not to be touched.⁷³

⁶⁴ Spart., *Vita Hadriani*, c. 25. See also an interesting passage in August., *Conf.* 9. 7. 16.

⁶⁵ *Loc. cit.* On kissing in general, see Sittl, *op. cit.*, 166-171.

⁶⁶ For many illustrations of cures wrought by touching, see Otto Weinrich, *Antike Heilungswunder*, pp. 19-37, 63, 67, 73, *et passim*; Sittl, *op. cit.*, pp. 323-324. See too Pliny, 20. 95, 135; 22. 31; 23. 110, 151; 25. 167; 26. 64, 93, 118, 133; 27. 51, 100; 28. 38, 57, 67, 82, 95, 102; 29. 42, 65, 75; 30. 24, 26, 35, 44, 52, 64, 76. See also Marcellus, *De Medicamentis*, 2. 7; 18. 4 (cf. Pliny, 28. 37); 23. 22, 35, 48, 50; 29. 35; 33. 5, 64. There are undoubtedly many other instances in Marcellus.

⁶⁷ Fabius Pictor, ap. Gell., 10. 15.

⁶⁸ Pliny, 28. 146.

⁶⁹ Pollux, *Onomast.*, 9. 41. An inscription of Cyprus invokes the anger of the Thundering Goddess against anyone who touches the grave of the deceased. — Le Bas-Waddington, *Inscr. d'Asie Mineure*, VI, No. 2739, Explic. p. 635.

⁷⁰ Ovid, *Trist.*, 3. 5. 7. Cf. Lactantius in Statii Theb., 10. 470.

⁷¹ Herod., 8. 37.

⁷² 8. Chapter I. 21, sect. 34.

⁷³ *Ibid.*

These passages tend to confirm a conclusion of Professor Murray's that it was because of the danger of contact that the stone given to Cronus was wrapped in swaddling clothes, and that for the same reason the stone of the Great Mother is represented on a coin as covered with a goat-skin.⁷⁴ It will be recalled that the priest who touched the Ark of the Covenant was smitten dead for his sacrilege, even though he was trying to keep it from falling.⁷⁵

When the fetial Marcus Valerius made Spurius *pater patratus*, he touched his head and hair with the verbenā.⁷⁶ In the ceremonies of the Lupercalia some of the priests touched with a bloody knife the foreheads of two youths of noble birth, who in turn struck with thongs all whom they met.⁷⁷

In order to find out Jupiter's wishes with regard to the successor to Romulus, an augur, after much introductory ceremony, put his hand upon the head of Numa Pompilius and asked if it was the divine will for him to be king.⁷⁸ There is "a statuette from Athens, of a female deity holding a torch or distaff, whose hand rests on the head of a small figure of a man by her side."⁷⁹ This suggests the position of the hand on the head in some modern ceremonies of baptism.

The head was sometimes touched with smoking sulphur,⁸⁰ which was generally regarded as purificatory. In the festival of Pales bleating sheep were touched with sulphur.⁸¹

In the formula of making a vow a Roman touched the earth with his hand when he named Tellus; when he named Jupiter, he raised his hands heavenward; and when he said he undertook the responsibility for the vow, he touched his breast with his hands.⁸²

⁷⁴ *Anthropology and the Classics* (edited by Marett), p. 88.

⁷⁵ II Samuel, ii. 6-7.

⁷⁶ Livy, 1. 24. 6.

⁷⁷ Plut., *Rom.*, 21. 4-5; cf. Plut., *Caes.*, 61.

⁷⁸ Livy, 1. 18. 8.

⁷⁹ Rouse, *Greek Votive Offerings*, p. 289.

⁸⁰ Propert., 4. 8. 86.

⁸¹ Ovid, *Fasti*, 4. 740.

⁸² Macrob., *Sat.*, 3. 9. 12.

In invoking the deities of the earth the hands might be stretched downward.⁸³ It was, however, more usual to touch the earth.⁸⁴ Macrobius⁸⁵ says that the "ancients" made their vows or prayers to Ops while sitting, and that they repeatedly touched the ground, thereby signifying that Mother Earth herself was to be appealed to by mortals.⁸⁶

There was what we might call the "sacrificial" touch. In the rites of the Arval Brothers boys who were *patrimi* and *matrimi* regularly touched offerings of *fruges aridae et virides, pulmenta, pultes, panes laureati, tuscanicae, unguenta* and *arae*.⁸⁷ In summing up his views on Cretan bull-fighting Cook⁸⁹ says: "In any case it seems probable that the religious value of the original bull-sports lay in the athlete's contact with the horn of a sacred bull."

The sanctity and trustworthiness of an oath were greatly enhanced by contact with an altar or with things that were divine or highly esteemed, a procedure that reminds one of our custom of laying the hand upon the Bible. Hannibal was touching⁹⁰ the altar (or the offerings upon it) when he swore that as soon as he should be able he would be an enemy of the Roman people.⁹¹ A certain Hermochares fell in love with Ctesylla. In giving initial assent to the match the girl's father Alcidas touched

⁸³ Livy, 7. 6. 4. Cf. Servius on Verg., *Aen.*, 4. 205: *Inferos demissis ad terram manibus invocamus*.

⁸⁴ Varro, *Res Rust.*, 1. 2. 27; Plaut., *Most.*, 467; *Homeric Hymn to Apollo*, 162-163. For other references and an interesting note, see Longworth, *Plautus' Pseudolus*. I. 3. 117 (1. 351), the *Classical Review*, 13. 272-273. See also Sonnenschein's second edition of the *Mostellaria*, p. 107. The act of touching the earth is not similar to the beating of the earth by Cleanthes in order to make Amphiaraus hear in the realms below (Cic. *Tusc.*, 2. 60).

⁸⁵ 1. 10. 21.

⁸⁶ See Sittl, *op. cit.*, p. 190.

⁸⁷ See Henzen, *Acta Fratrum Arvalium*, pp. CXX, CXXVIII, CXCVII, CCIII, CCV, CCVI, CCVIII, CCXVIII, CCXXV, and also *C. I. L.*, VI. 32391.

The horns of a bull consecrated to sacrifice might be touched.⁸⁸

⁸⁸ Val. Flacc., 1. 787: cf. Leviticus, i. 4; iii. 2, 8, 13; iv. 4, 24, 29.

⁸⁹ *Zeus*, I, 499.

⁹⁰ Nepos, *Hannibal*, 2. 4, and Val. Max., 9. 3, Ext. 3, use *tenere* (cf. Polyb., 3. 11. 7), but Livy, 21. 1. 4, employs *tangere*.

laurel as being sacred to Apollo and took oath by the god.⁹² The Nasamones, an African tribe, were accustomed to swear with their hands upon the sepulchres of those who were generally held to have been the most just and excellent persons among them,⁹³ a very praiseworthy form of oath-taking. Both Greeks and Romans were wont to swear by very essential parts of the body, chiefly the eyes.⁹⁴ The Hebrews put their hands upon the thighs of other persons in taking oaths.⁹⁵

Suppliants and worshippers either touched or held or embraced altars.⁹⁶ *Aras tangite supplices*, is the exhortation of a chorus of Thebans in Seneca's *Hercules Furens* (876).⁹⁷ If the altars were not held by the worshippers, the sacrifices were not pleasing to the gods.⁹⁸ A charming picture of Roman devotions is to be found in Horace, *Odes*, 3. 23. 17-20:

⁹¹ Cf. Apoll. Rhod., 2.717: ἀπτόμενοι θνέων and Sil. Ital., 3.82-83:

*Tangat Elissaeas palmis puerilibus aras,
Et cineri iuret patrio Laurentia bella.*

The breaking of an oath or of an agreement made at the altar was a very serious offense. See Propertius, 3. 20. 25-28; Justinus, 24. 2. 8; and many interesting passages in Mayor's note on Juvenal, 13. 88. See also Cicero, *Pro Balbo*, 12.

⁹² Ant. Lib., 1.

⁹³ Herod., 4. 172. Contrast Pausan., 3. 20. 9 and 5. 24. 9. See Frazer's note on 3. 20. 9.

⁹⁴ Petron., *Sat.*, 133; Tibullus, 3. 6. 47; Ovid, *Amor.*, 2. 16. 44; 3. 3. 13; 3. 11. 48; Propertius, 1. 15. 33-36. See too Herodas, 6. 23 and Headlam *ad loc.* On the way the eyes were cherished, see Catullus, 104: *ambobus mihi quae carior est oculis*. A being dearer than the eyes must have aroused the acme of affection.

⁹⁵ See Gen. xxiv. 2 and xlvii. 29, and also the learned biblical commentaries on these passages.

⁹⁶ E. g., *tangere*, Verg., *Aen.*, 12. 201; Juv., 14. 219; Plaut., *Rud.*, 1333-1334; *teneo*, Verg., *Aen.*, 4. 219; 6. 124; Plaut., *Rud.*, 1336; Cic., *Pro Flacc.*, 90; Varro ap. Macrobi., *Sat.*, 3. 2. 8-9; Nepos, *Hannibal*, 2. 4; Val. Max., 9. 3, Ext. 3 (cf. I Kings, i. 50; ii. 28); *amplector*, *amplexor*, Ovid., *Met.*, 5. 103; 9. 772; *complectere*, Sen., *Herc. Fur.*, 503; *Herc. Oet.*, 814; *apprehendere*, Macrobi., *Sat.*, 3. 2. 7; *prensis* . . . *altaribus*, Verg., *Catal.*, 13 (5). 22. See too Lactantius Placidus in Statii Thebaida, 12. 505.

⁹⁷ Cf. Ovid, *Am.*, 1. 4. 27: *Tange manu mensam, tangunt quo more precantes*.

⁹⁸ Varro ap. Macrobi., *Sat.*, 3. 2. 8; Serv. on Verg., *Aen.*, 4. 219. See too Sittl, *op. cit.*, p. 192.

Immunis aram si tetigit manus,
 Non sumptuosa blandior hostia
 Mollivit aversos Penatis
 Farre pio et saliente mica.

The altar was likewise a place of refuge, either for a Helen in days of adversity,⁹⁹ or a rascally slave like Tranio.¹⁰⁰

The biblical injunction that "whatsoever toucheth the altar shall be holy"¹⁰¹ was true of the classical peoples also. Hands polluted by blood were not to come in contact with the altars.¹⁰² Concubines were forbidden to touch the altar of Juno; in case one did so, it was necessary for her with unbound hair to sacrifice a white lamb to the goddess.¹⁰³

Like altars, the knees¹⁰⁴ and feet¹⁰⁵ were touched or embraced. Pliny¹⁰⁶ says that it is the practice of mankind to hold a kind of religious reverence for the knees. "These the suppliants touch, to them they stretch their hands, they adore them as altars because they are the seat of vitality." He explains that at the front of each knee-joint there is a kind of cavity such as is made in the mouth by puffing out the cheeks. From this if pierced the vital spirit escapes as from a mouth.

Greek suppliants were wont to touch the chin also.¹⁰⁷ Even statues of the gods or their appurtenances might be touched.¹⁰⁸

That sanctuary is but an extension of the beliefs about touching (if it is not indeed the same thing) is shown by an incident that

⁹⁹ *Aris invisā sedebat*, Verg., *Aen.*, 2. 574. Cf. Nep., *Paus.*, 5. 4-5.

¹⁰⁰ *Ego interim hanc aram occupabo*, Plaut., *Most.*, 1094. Cf. Plaut., *Rudens*, 846.

¹⁰¹ Ex., xxix. 37.

¹⁰² Ovid, *Met.*, 11. 584. Cf. Ovid, *Her.*, 7. 129-130; Stat., *Theb.*, 12. 540.

¹⁰³ Paul. Fest., s. v. pelices (Lindsay, p. 248).

¹⁰⁴ It is superfluous to give exact references. They can be found in great numbers in Liddell and Scott, s. vv. γόνυ, γυνάξομαι, ἄπτω, and in *Harper's Latin Dictionary*, s. v. genu. See Sittl, *op. cit.*, pp. 163-165.

¹⁰⁵ Sittl, *op. cit.*, p. 164 and note 6.

¹⁰⁶ 11. 250.

¹⁰⁷ Pliny, 11. 251. See too *Odys.*, 19. 473; *Iliad*, 1. 501; 8. 371; 10. 454; Sittl, *op. cit.*, p. 165. Cf. Eurip., *Hec.*, 344.

¹⁰⁸ E. g., the quiver of Apollo, Aristoph., *Eq.*, 1272; the foot of Ceres, Juv., 14. 219; the statues and couches of the gods, Just., 24. 2. 8.

occurred at Samos. When the Corinthians who were ordered by Periander to take three hundred noble Corcyræan youths to Sardis to be mutilated put in at Samos with their charges, the Samians had the boys touch the temple of Diana, whereupon they proclaimed sanctuary for the suppliants and would not suffer the Corinthians to remove them.¹⁰⁹

Perhaps the best known of the many instances in which the right of asylum or sanctuary was claimed is that of the Spartan king Pausanias. To escape the anger of the people he sought refuge in a temple. He was safe from attack, but the Spartans walled up the entrance and let him waste away through starvation. When he was at the point of death, they brought him out in order to save the temple from pollution.¹¹⁰

Eutropius, a grand chamberlain of the Byzantine court, wished to destroy the right of sanctuary, but by the irony of fate he himself was only too glad to take advantage of it later on.¹¹¹

In order to excuse an act of temple-violation the Athenians on one occasion resorted to the obviously specious argument that "altars were a refuge in cases of involuntary misdeeds, and transgression was a term applied to those who do evil without compulsion, and not to those who are driven by misfortune to some act of daring."¹¹²

As regards traditional beliefs about touching, the early Christians in Europe found no necessity of making any great readjustment. One cannot appreciate the wide range of these ideas in both the Old Testament and the New unless he looks up the

¹⁰⁹ Herod., 3. 48.

¹¹⁰ Nepos. *Paus.*, c. 5; Diodorus, 11. 45; Polyænus, 8. 51. Contrast Val. Max., 1. 3. 4.

¹¹¹ For references and interesting material on the right of sanctuary, see James E. Dunlap, *The Office of the Grand Chamberlain in the Later Roman and Byzantine Empires*, pp. 282-284. (This is Part II of Boak and Dunlap, *Two Studies in Later Roman and Byzantine Administration*.) For still other instances see Herod., 2. 113; Livy, 1. 8; and the classical dictionaries, *s. vv.* *ἄσυλος*, *asylum*. In Hugo's novel, *Notre Dame de Paris*, Esmeralda is carried into the church by the hunchback, whereupon sanctuary is proclaimed for her. See also the *Century Dictionary*, *s. v.* *sanctuary*.

¹¹² Thuc., 4. 98. 6 (C. F. Smith's trans.)

references *s. vv.* touch, touched, toucheth, in *The Exhaustive Concordance of the Bible*, by James Strong.

St. Eugenius healed blindness. On one occasion an irresponsible bishop of the Arians named Cyrola persuaded a worthless character to pretend that he was blind and to ask for restoration of sight. When an opportunity came for the display of Cyrola's supposed powers, he placed his hands above the man's eyes, saying: "By our faith by which we rightly believe in God, let thine eyes be opened." The man was then actually stricken with blindness. Thereupon Eugenius had two Christians, Vindemialis and Longinus, place their hands on the blind man. When they had done this and were holding their hands above his head, St. Eugenius made the sign of the cross before his eyes, and uttered a prayer. At once the pain disappeared and the man was restored to his former health.¹¹³

It will be recalled that Naaman expected to be cured by being touched and by an invocation to the deity,¹¹⁴ and that a diseased woman touched the hem of Christ's garment with full assurance that she would be cured.¹¹⁵ Irenæus¹¹⁶ makes reference to practitioners who claimed to heal the sick merely by laying their hands upon them.

A Roman matron, a paralytic who had been confined to her bed for four years, was restored to health through the prayerful intercession of a certain Palmatius. When she regained control of her limbs, she wanted to be baptized "in the name of the Master Jesus Christ who held her hand and cured her."¹¹⁷

The spirit of pagan superstition is well illustrated by the actions of a monk who in a fanatical desire to keep free from all possible sources of wickedness is said to have wrapped his hands in his garments before lifting his mother across a stream. When asked why he covered his hands, he replied: *Quia corpus mulieris*

¹¹³ Gregory of Tours, *Hist. Franc.*, II. 3. 48-49 (Migne, 71, p. 194).

¹¹⁴ II Kings, v. 11.

¹¹⁵ Matthew, ix. 20-21.

¹¹⁶ *Contra Haer.*, 2. 32. 4.

¹¹⁷ *Acta Martyrū S. Callisti*, c. 5 (Migne, *Patrol. Graec.*, 10. p. 118).

*ignis est. Et ex eo ipso quo te contingebam, veniebat mihi commemoratio aliarum feminarum in animo.*¹¹⁸

It was not necessary to establish immediate contact in order to transmit *mana*. This we have seen in the case of Circe's wand and the verbená of the fetial. Even long-distance transmission was possible. On consecrating the neighboring island of Rheneia the Samian despot Polycrates connected it to sacred Delos by a chain.¹¹⁹ In order to place themselves under the protection of Artemis against the attacks of Crœsus, the citizens of Ephesus carried a rope seven furlongs from the walls of the city to her temple.¹²⁰

Plutarch¹²¹ narrates an interesting story that might well be quoted to every class in Vergil. Some conspirators who had taken refuge in the temple of Athena upon the Acropolis of Athens were persuaded to come down and to stand trial. "They fastened a braided thread to the image of the goddess and kept hold of it, but when they reached the shrine of the Erinyes on their way down, the thread broke of its own accord, upon which Megacles and his fellow-archons rushed to seize them, on the plea that the goddess refused them the rights of suppliants. Those who were outside of the sacred precincts were stoned to death, and those who took refuge at the altars were slaughtered there; only those were spared who made supplication to the wives of the archons."¹²²

THE THEORY OF MAGICAL TOUCHING

The influence of the deity was believed to travel along a cord, rope or other bond in much the same way that the benumbing power of the electric ray was supposed to be transmitted along or through a medium. It was said that there were rays which

¹¹⁸ *Verba Seniorum*, 4. 68 (Migne, *Patrol. Lat.*, vol. 73, p. 874).

¹¹⁹ Thuc., 3. 104. 2.

¹²⁰ Herod., 1. 26.

¹²¹ *Solon*, 12. (Perrin's trans.)

¹²² Numerous illustrations of indirect contact are to be found in a valuable article by Professor Bonner, "The Sacred Bond," *T. A. P. A.*, 44. 233-245. For interesting instances from the folklore of other lands, see Tylor, *Primitive Culture*, I (1920). 117.

could benumb the strongest arms, even though one was pricking them with a spear or branch.¹²³ Aelian¹²⁴ and Plutarch¹²⁵ are equally extravagant in their statements. According to them it could transmit its numbing power through nets or receptacles. If a person poured water on it when it was on land, the water would act as a conductor for its stupefying power.

As the eating of the heart of a lion or of a brave man enables one to acquire bravery, so under certain circumstances the act of touching causes or enables a person to share in the sanctity or the character, good or bad, of the person being touched. Touching is therefore an operation in spiritual transfusion. Since the wooden horse was to all intents and purposes the statue of Pallas Athena herself, the touching of the ropes indicated confidence in the reestablishment of her beneficence and of her protecting influence.

The spirit that actuated touching is best illustrated in my opinion by a jesting instance, which shows incidentally how familiar even the higher circles were with popular notions about touching. On one occasion when Sulla was watching a gladiatorial spectacle, there was sitting near him a woman of noble birth and great beauty, who (like most beautiful women) was a divorcee. She rose and passed behind him, at the same time resting her hand upon him and plucking a bit of nap from his mantle. When Sulla gazed at her in bewilderment, she exclaimed: "It's nothing of consequence, dictator, but I too wish a small share of thy felicity."¹²⁶ The act tickled Sulla's vanity, apparently because it was a subtle attribution of divinity to him.¹²⁷

¹²³ Pliny, 32. 7 (Cf. 9. 43).

¹²⁴ Aelian, *De Nat. Anim.*, 9. 14.

¹²⁵ Plut., *Mor.*, 978 B-C.

¹²⁶ Plut., *Sulla*, 35. Although I have already referred to the passage, I can't forbear quoting here the exact words of Matthew, ix. 20: "And, behold, a woman, which was diseased with an issue of blood twelve years, came behind him, and touched the hem of his garment. 21. For she said within herself, 'If I may but touch his garment, I shall be whole.'"

¹²⁷ For another jesting instance, see Ausonius, *Epigram* 81.

THE COMIC USE OF *TANGO*

The variety and amount of the material on the folk-lore of touching give me confidence to hazard a conjecture on a question in semasiology. In Plautus the word *tango* is frequently used in telling how indulgent fathers and other equally gullible persons are "touched" for money.¹²⁸ Nonius explains this use of *tangere* by *circumvenire*.¹²⁹ Ramsay says in his edition of the *Mostellaria*, p. 67, that it is not easy to determine how *tangere* came to bear this force. It would add a touch of humor to the Plautine passages if we might suppose that the figurative touching of a person brought material benefits in the same way that actual contact with things divine brought spiritual blessings. The earth was touched or beaten in an appeal to the gods of the lower world. Making an appeal to fathers and guardians by figurative touching is not a far cry from this practice.

It is certain that there must have been a physical basis for the transferred use of *tangere* (or of the Greek verb of which it may be a translation). The chorus in Aristophanes, *Equites*, 1272-73, says of the appeal of Thumantis to Apollo: *σᾶς ἀπτόμενος φαρέτρας . . . μὴ κακῶς πένεσθαι*. This touching is both literal and figurative, since 'touching thy quiver' means also 'imploring' and has an infinitive, 'not to suffer ills of poverty,' dependent upon it. In much the same way *γονάεσθαι*, 'to kneel' (i.e. 'to clasp the knee') came to mean 'entreat,' or 'supplicate.'¹³⁰ It will be recalled that the story of Midas had long since associated touching with wealth.

Since spendthrift young men generally want money for purposes for which it would be hard to gain approval by frankness, it is easy to see how *tangere* could acquire the meaning *circumvenire*, "to get around." In Plautus, however, it is better to translate *tangere* by our slang "touch," rather than by "cheat" or "dupe," a suggestion that has already been made in our annotated editions.

Though this explanation of the comic use of *tango* is only a

¹²⁸ E. g., *Pseudolus*, 119; *Epidicus*, 705; *Poenulus*, 1286.

¹²⁹ P. 67 (Lindsay's ed.)

¹³⁰ See Liddell and Scott.

theory, it provides a plausible suggestion for a transfer of meaning that does not seem to have been otherwise accounted for.

MODERN INSTANCES

The belief in the power of the act of touching did not die with antiquity. The best known illustration of it is the royal touch for scrofulous diseases, commonly called King's Evil. It was said that the French kings inherited this power of healing from St. Louis or even Clovis, the latter of whom ascended the throne in 481 A.D.¹³¹ On Easter Sunday, 1686, Louis XIV touched 1,600 persons. Charles II touched as many as 92,107 persons during his reign. The last person touched by an English sovereign was Dr. Johnson, to whom Queen Anne ministered.¹³²

People crowded about Joan of Arc and asked her to bless crosses and chaplets by her touch.¹³³ Under date of January 20, 1664, Samuel Pepys explains how he learned why his hare's foot, which had no joint, failed to work. A friend had one with a joint and "he never had his cholique since he carried it about with him: and it is a strange thing how fancy works, for I no sooner handled his foot but I became very well and so continue."

During the regency of the Duke of Orléans, 1715-1723, Law, a Scotchman, inaugurated in Paris the use of paper money. Amid the frenzied speculations in 1719 in the narrow streets forming the financial center, a hunchback made 150,000 *livres* by renting his back to the stock-jobbers as a writing-desk.¹³⁴

In Thomas Hardy's story, "The Withered Arm" (*Wessex Tales*), the afflicted woman is advised by Conjuror Trendle to "touch with the limb the neck of a man who's been hanged."

¹³¹ See Boswell's *Life of Johnson*, I. 15-16 (Macmillan ed.)

¹³² For general information and bibliography on King's Evil, see Hastings, *Encyclopædia of Religion and Ethics*, s. v. King's Evil; Frazer, *The Magic Art and the Evolution of Kings*, I (1917). 368-370; W. G. Black, *Folk-Medicine*, pp. 100-101, 140-144; Halliday, *Greek Divination*, pp. 25-26; Walsh, *Curiosities of Popular Customs*, p. 934; J. E. Vaux, *Church Folk-Lore*, 303-307; Macaulay, *The History of England from the Accession of James II*, chap. XIV.

¹³³ Green, *History of the English People* (Rev. ed.), 1. 352.

¹³⁴ Leclercq, *Histoire de la Régence*, II. 397; Larousse, *Grand Dictionnaire Universel du XIX^e Siècle*, s. v. bossu.

An extract from *Nature* (London, Vol. 107, p. 705) reads as follows: "In Paris hunchbacks have a regular *clientèle*, who make a point of touching the deformity before an important deal; while one French actor is said always to have a hunchback in his dressing-room during a first night." The following sentence appeared in a New York newspaper: "Some brokers think it is good luck to see a hunchback. If they can touch the deformity it will bring gain. Such a touch is supposed also to cure a headache."¹³⁵ A more general form of the superstition is that "It is lucky to meet, and still better to touch, a hunchback."¹³⁶

A newspaper clipping of December 3, 1920, reports that just prior to examinations in a large Eastern university students playfully touched the captain of the football team, who had won the toss in all of the games of the preceding fall. In the summer of 1923 an item in a Philadelphia paper told how a Gypsy asked a merchant for permission to touch his money-bags in order to bring him good luck.¹³⁷

A part of a clipping dated January 2, 1924 reads as follows: "A committee of prominent clergymen and medical authorities appointed by the Archbishop of Canterbury after the Lambeth Conference in 1920 to study the relationship of religion and healing has made a report in which it is understood to have stated that 'no sick person must look to a clergyman to do what is a physician's or a surgeon's duty to do.' The committee, in studying the question of recognizing the ministry of healing within the Church, heard evidence on behalf of Christian Science, healing by faith, *laying on of hands* and the blessing of the sick."

It is easy to find other forms in which the ancient superstition has come down to us. We still touch wood. Lovers still delight to touch or handle objects that belonged to their sweethearts. In

¹³⁵ Quoted by Bergen, *Animal and Plant Lore*, p. 22.

¹³⁶ *Loc. cit.* See also *Folk-Lore*, 26. 172.

¹³⁷ For other popular instances of touching, see Elworthy, *The Evil Eye*, pp. 22, 36, 38, 233; Bergen, *Animal and Plant Lore*, p. 117; Frazer, *Balder the Beautiful*, I. 87, 90; Frazer, *Pausanias*, III. 66; Hastings, *op. cit.*, 3. 66; W. G. Black, *op. cit.*, p. 101; *Folk-Lore*, 12. 101; 21. 313-314; 505-506. See too Shakespeare, *Macbeth*, IV. iii. 160-164.

church services there are reminiscences of pagan uses of the hands,¹³⁸ but they have become merely symbolic in form.

The folk-lore of touch is merely one more illustration of the truism that in order to know the present we must study the past.

¹³⁸ Herzog, *Realencyclopädie für protestantische Theologie und Kirche*, s. v. *Handauflegung*.



The Classical Astral Weather Chart for Rustics and for Seamen

Author(s): Eugene S. McCartney

Source: *The Classical Weekly*, Vol. 20, No. 6 (Nov. 15, 1926), pp. 43-49

Published by: [Classical Association of the Atlantic States](#)

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The Classical Weekly

VOL. XX, No. 6

MONDAY, NOVEMBER 15, 1926

WHOLE No. 536

LIGHT ON THE AENEID

In a volume entitled *Excavations at Carthage 1925* (New York, The Macmillan Company, 1926. Pp. x + 51), Professor Francis W. Kelsey gives A Preliminary Report setting forth "the more important results of the work of the Franco-American Staff at Carthage in 1925. . . ." On pages 43-49 he discusses the cinerary urns. Some things found in these urns lead Professor Kelsey to discuss (47-49) anew the question of human sacrifices at Carthage. Among other things he says (48-49):

... One writer, M. P. Pallary¹. . . finds in the precinct of <the goddess> Tanit <at Carthage>. . . full confirmation of this horrible practice among the Carthaginians. . . Furthermore, he interprets as a survival from an early Semitic ritual of sacrifice a custom still in vogue among the Jews in North Africa. When the first male child is born in a Jewish home, he says, a member of the Cohen family, which formerly conducted the sacrifices, presents himself at the home of the parent and demands the babe as belonging to him. The mother acknowledges the absolute right of the Cohen, and offers to ransom the child: the ransom is arranged by means of gifts.

This passage must at once lead us to recall Vergil's statement that certain rites were regularly entrusted to certain families. Compare Aeneid 8.268-270:

Ex illo celebratus honos, laetique minores
servavere diem, primusque Potitius auctor
et domus Herculei custos Pinaria sacri.

Livy (1.7.12) refers to the same thing: *adhibitibus ad ministerium dapemque Potitiis ac Pinariis, quae tum familiae maxime inclitae ea loca incolebant*. Compare also 9.29.9 *Potitia gens, cuius ad Aram Maximam Herculis familiare sacerdotium fuerat*.

In Professor Kelsey's Report, page 48, note 2, we read:

... in November, 1925, American newspapers published the following despatch, sent out by the Associated Press:

"Pueblo, Colorado, Nov. 8. The love of a Ute Indian for his bride, which caused him to bury his 17-day old baby alive in the grave of its mother, believing it would bring her back to life, will bring Platt Nae face to face with the white man's law here to-morrow in a federal court trial for murder.

"Nae, who has been held in jail here since last February, will invoke the law of the medicine man for his defense. He contends that he buried the child on the advice of his father-in-law, Mormon Joe, medicine man of the Utes, who is also held as an accessory".

I had myself clipped and preserved two newspaper accounts referring to the same incident, but in a manner more distinctly suggestive of Vergil. One from The New York Sun, April 2, 1925, said, in part, as follows:

¹In *Revue Tunisienne*, 1922, 206-211.

The Government charges that Pate Nay <sic>, . . . whose squaw recently died, wrapped the body in a blanket with the child and buried them, on "coercion of Mormon Joe". The bodies were exhumed on the reservation last week. The verdict of a Coroner's jury was that the infant was buried alive and that its mother died of natural causes.

Another from the same paper, November 17, 1925, said:

Testimony showed that he wrapped the live baby in the burial blanket with its dead mother, permitted them to lie on the Ute camp ground throughout a February night and buried them the next day in a shallow grave—all under the orders of Mormon Joe, medicine man and father-in-law of May <sic>. . . . The testimony showed that May feared Mormon Joe, and obeyed his command because disobedience might have meant death, and that he also was an unwilling servant of the medicine man when he bound the bodies of his dead bride and his live son together and prepared them for burial.

Of course this cannot fail to suggest Aeneid 8.485-488:

mortua quin etiam iungebat corpora vivis,
componens manibusque manus atque oribus ora,
tormenti genus, et sanie taboque fluentis
complexu in misero longa sic morte necabat.

Of this Nettleship, in his revision of Conington's edition (1883), says: "This trait seems to have been borrowed by Virg. from the historical barbarities of the Etruscan pirates". But I have been led to wonder whether the custom may have a more primitive origin than that, in some savage practice prevalent among races as divergent as Etruscans and North American Indians. A search through The Golden Bough has revealed no reference to anything of the sort; but perchance some authority on the subject of magic and superstition can offer enlightenment in the matter.

HUNTER COLLEGE

E. ADELAIDE HAHN

THE CLASSICAL ASTRAL WEATHER CHART FOR RUSTICS AND FOR SEAMEN¹

Quid faciat laetas segetes, quo sidere terram
vertere, Maecenas, ulmisque adiungere vites
conveniat.
hinc canere incipiam.

Thus, at the beginning of his Georgics (1.1-5), Vergil

¹Other studies of weather lore by the author to be found in THE CLASSICAL WEEKLY are An Animal Weather Bureau, 14.89-93, 97-100; The Folk Calendar of Times and Seasons, 16.3-7; The Plant Almanac and Weather Bureau, 17.105-108; Magic and the Weather in Classical Antiquity, 18.154-157, 163-166.

References to several works are so frequent in these Notes that each work will be cited by the name of the author only, thus: Aratus (= Aratus, *Phaenomena*); Columella (= Columella, *De Re Rustica*); Hesiod (= Hesiod, *Works and Days*); Pliny (= Pliny, *Naturalis Historia*); Theophrastus (= Theophrastus, *De Signis*); Varro (= Varro, *Res Rusticae*).

I wish to express indebtedness to Guilelmus Gundel, *De Stellarum Appellatione et Religione*, in *Religionsgeschichtliche Versuche und Vorarbeiten*, 3 (1906), 93-225.

proclaims that it is part of his purpose to tell under what star one should turn the earth and train the vines to the elms. Farther on in the same poem² he says of the constellations:

'From them we can predict the weather, though the sky be doubtful, from them the day of harvest and the time to sow, and when one may ply the treacherous smooth sea with his oars and launch the well-armed fleet, or overthrow in season the pine in the forest. It is not in vain that we observe the rising and the setting of stars³ and the year equally divided into its four different seasons'.

Vergil, doubtless seeing how much more readily the sailor read the heavens than did the peasant⁴, concluded that this condition had prevailed ever since man made his first dugout⁵, but, as Servius says⁶, *Non omnia prudenter a poeta dicenda sunt*.

The Romans applied to almost all the stars Greek names or Latin translations of Greek names. Since the pastoral and agricultural stages of civilization long preceded any extensive commerce on the Mediterranean or other seas⁷, it is hardly believable that the Greeks, living in a country the climate of which permitted them to watch their flocks by night during a great part of the year, would leave the naming of the stars to sailors. As was pointed out by Dr. Walter Leaf⁸, the names of stars mentioned by Homer are in general taken from the lives of huntsmen and shepherds. The later catalogue of names reflects likewise the activities of husbandmen and even of fishermen who were not necessarily seamen. Varro⁹ realized how they smacked of the soil, but he thought they had been given by astronomers. Vitruvius¹⁰ evidently regards the vast body of astral weather predictions as the result of scientific astronomical investigations of the rising and the setting of the stars. Through all ages sailors have been especially weather-wise, and of necessity, but they merely added to the traditional lore of landlubbers such knowledge as their new experiences enabled (or forced) them to acquire.

No picture of the everyday life of the rustic of antiquity can be complete if it does not take into account his familiarity with the heavens. We ourselves get our weather knowledge from the morning paper; the rustic got his most dependable forecasts at first hand from the skies. He knew something of the ways and the habits of the stars, and to this extent was an astronomer. The comparatively small amount of astral weather lore to-day is due, I believe, to ignorance of the constellations more than to greater diffusion of knowledge. Our unfamiliarity with the heavens is doubtless to be ascribed in large measure to the greater prevalence of indoor life.

The oldest considerable body of homely weather maxims of the Greeks is to be found in Hesiod's *Works and Days*. I doubt not that it was stock information

that was hoary with age long before Hesiod was born, and that his great contribution was to sift from a far larger body of sayings those that he thought most trustworthy for Boeotia¹¹. It is hard to imagine a time so far back that there were no local weather savants¹². According to some of the rationalizing ancients¹³, Aeolus was such, and his services to Ulysses consisted not in giving him a sack of winds, but in telling him what winds blew when the various constellations were rising.

Sophocles¹⁴, noting how common and indispensable such knowledge was, makes Prometheus the originator of it, as of so many other blessings to mankind. He represents this great benefactor as saying of the men of old:

'They did not have any dependable information of winter or of the flowering spring or of the productive summer, but did everything entirely without knowledge until I showed them the risings of the stars and their settings, difficult to determine'.

Though Prometheus may have been the first to read for men the calendar in the sky, to the providence of Zeus must be attributed its existence:

He tells what time the soil is best for the labour of the ox and for the mattock, and what time the seasons are favourable both for the planting of trees and for casting all manner of seeds. For himself it was who set the signs in heaven, and marked out the constellations, and for the year devised what stars chiefly should give to men right signs of the seasons¹⁵, to the end that all things might grow unfaillingly. Wherefore him do men ever worship first and last¹⁶.

The signs of the zodiac, which Zeus has set on every side, mark the year, the time to plow and to sow the fallow field, and the season to plant the tree¹⁷. In Xenophon's *Oeconomicus*¹⁸ it is stated, in a matter-of-fact way, that, as autumn comes, all men look to god for the time when he will rain and thus permit them to sow the earth.

It would seem, therefore, that the exhortation of Aratus¹⁹ to heed the sun, moon, and stars was somewhat superfluous. An indication of the Greek interest in the contents of Aratus's work is given by the fact that we have the names of twenty-seven Greeks who composed commentaries upon it²⁰.

¹¹I believe that Hesiod was to no small degree a redactor of agricultural knowledge. Genius though he was, I think him less of an innovator than did Pliny (18.201).

¹²Theophrastus says (3) that it is always possible to find such an observer. A Scholium on Aratus 765 asserts that a skilful forecaster could read the signs for three and five days in advance.

¹³Palaephatus, Chapter 17 (page 25 in the Teubner edition of *Mythographi Graeci*, Volume 3, Fasciculus 2). For another account of the source of his wisdom see THE CLASSICAL WEEKLY 18.156 (top of first column).

¹⁴Prometheus 454-458. Compare Varro, *De Lingua Latina* 7.73: *Arbitror antiquos rusticos primum notasae quaedam in caelo signa quae praeter alia erant insignia atque ad aliquem usum culturae et tempus designandum convenire animadvertentur*. A rationalized version of the myth of Atlas says that he was the first to realize the possibilities of weather prediction by the study of astronomy. See Heraclitus, *De Incredibilibus*, Chapter 4 (page 74 in the Teubner edition of *Mythographi Graeci*, Volume 3, Fasciculus 2).

For other traditions in the Argolic peninsula see Sophocles, Fragment 390 (in Nauck's *Tragicorum Graecorum Fragmenta*), and Theon *Ad Arati Phaenomena* 27.

¹⁵See also Aratus 451-452; Columella 1, Praefatio 23; Eustathius, *Migne, Patrologia Graeca* 18.720.

¹⁶Aratus 7-14 (G. R. Mair's translation). Compare Philo, *De Mundi Opificio* 18-19, and Diodorus 1.81.4-6.

¹⁷Aratus 741-743. Compare Pliny 18.201.

¹⁸17.2. Compare Pliny 18.224. ¹⁹752-777.

²⁰See J. Boehme, *Das Sogenannte Aratkommentatoren-Verzeichniss im Vatikan, Rheinisches Museum* 42 (1887), 307-309. The commentary of Hipparchus Bithynius has survived. See Carolus Manitius, *Hipparchi in Arati et Eudoxi Phaenomena Commentariorum Libri Tres* (Teubner edition, Leipzig, 1894).

²1.252-258.

³Plato would have assented to this. See Galen, *De Historia Philosophica* 2. 13 (Kühn's edition, 19.274).

⁴Georgics 1.204-207; compare 1.50-51. Pliny 18.206 quotes Vergil with approval. See also *Aetna* 243-244.

⁵Georgics 1.136-138. ⁶On Georgics 1.366.

⁷Cicero, *De Divinatione* 1.2, says that the 'Assyrians' (i. e. Babylonians) were naturally led to observation of the stars because of the flatness of the country in which they lived.

⁸In a note on *Iliad* 18.486.

⁹2.1.7-8.

¹⁰6.3.

The knowledge that we take more or less for granted among the Greeks was not quite so common among the Romans. Pliny²¹ bemoans the fact that there were peasants who were ignorant of stars as well as of letters. He is not entirely consistent with himself, however, for, in the same book²², with the ardor of a propagandist he urges his countrymen to learn the signs of times and seasons as conveyed by plants, 'the Vergiliae of the earth', in the same way that they know those of the heavens.

I believe, therefore, that, while the weather knowledge which the Romans derived from the heavens might not compare well with that of the Greeks, it still implies an enviable familiarity with the constellations. I say this in spite of the fact that Vergil and Ovid make mistakes in their astronomy. Even Columella, who did not have to pay heed to literary tradition, made glaring errors.

Though the ancients did not possess the equipment for a really scientific study of meteorology, they were fully alive to the advantages and the necessity of regulating their conduct by weather prognostications. The following conclusion of a discussion of celestial weather signs²³ is illuminating:

'Who does not know, therefore, how much profit man derives from observing them? Foreseeing dangers, those bent on putting to sea can keep their ship in port²⁴; the wayfarer likewise, warned by overcast skies, awaits clear weather; husbandmen too, warned by signs they have learned, check their zeal in the interests of their seeds and plants, and stop work till a suitable season'.

Weather knowledge was also a matter of official concern in antiquity. It is greatly to the credit of the ancients that, however much they erred, they put their greatest trust in celestial signs. Men in authority finally realized that, if there was any solution to their weather problems, it lay in the heavens. This realization was in itself an important step in the right direction.

In lieu of almanacs and newspapers they engraved, upon brass or stone, tables of the rising and the setting of the important stars and the various kinds of weather that might be expected to accompany these movements²⁵. These were nailed or hung up in places where people congregated, such as market-places, and hence were called *Paraepgmata*, 'Affixtures'²⁶. They might almost be called 'billboard' calendars.

Interesting and important fragments of such star-calendars have been found in Miletus²⁷. An excellent idea of their character can be gained likewise from the literary fragments of the *Paraepgma* of Democritus²⁸.

We are fortunate in possessing star-catalogues con-

taining material similar to that in the *Paraepgmata*. Most representative, perhaps, are those drawn up by Geminus²⁹, whose floruit was about 80 B. C., and by the famous Ptolemy³⁰ (about 140 A. D.). The most detailed is to be found in Lydus, *De Ostentis* 59-71. A very brief catalogue occurs in the *Geoponica*, 1.9.

The calendar of Columella (11.2) gives a great deal of (mis)information about the weather, but goes into greater detail with regard to farming operations. The same may be said of the similar material in Pliny, 18.201-320. Varro (1.29-36) is more general and condensed. These Latin references remind one of a *Kalendarium Rusticum*, or *The Husbandman's Monthly Directions*, which was published in England in 1669³¹.

The *Phaenomena* of Aratus, which made a great impression upon Romans as well as upon Greeks, was translated by Varro Atacinus, Cicero³², Germanicus Caesar³³, and Avienus³⁴. The *Prognosticorum Reliquiae*³⁵ of Germanicus Caesar is devoted almost exclusively to the second type of information contained in the *Paraepgmata*, i. e. to the signs of the kind of weather indicated or caused by the stars.

For the sake of brevity I am refraining almost entirely from quoting sources which contain in small compass much material pertinent to this paper, and therefore refer the inquisitive reader to the fragments from Miletus, the passages mentioned in Geminus, Ptolemy, and Lydus, the *Prognosticorum Reliquiae* of Germanicus Caesar, and the Latin translations of Aratus. By great good fortune, however, the weather lore that I am omitting, so far as it is associated with definite days, has been collected and arranged in a composite calendar in Daremberg et Saglio, *Dictionnaire des Antiquités Grecques et Romaines* (s. v. *Kalendarium*, Volume I, Part 2, 838-849).

STARS AS CHRONICLERS OF SEASONS

"All these constellations", says Aratus³⁶, "thou canst mark as the seasons pass, each returning at its appointed time; for all are unchangingly and firmly fixed in the heavens to be the ornaments of the passing night". They are the means of differentiating months³⁷ as well as seed-times and harvest-seasons³⁸. Certain stars marked the *articuli anni*, 'the joints of the year'³⁹, which were sometimes called the *cardines temporum*, 'the hinges of the seasons', the times of transition from

²¹18.205. ²²251-253. ²³Eustathii *Hexaemeri Metaphrasis* 6.4 (Migne, *Patrologia Latina* 53.925). Compare Columella 11.1.32; Scholia on Aratus 743, 756, 758.

²⁴See also Aratus 758-764; Vergil, *Georgics* 1.454-463. ²⁵Scholia on Aratus 752; Aelian, *Varia Historia* 10.7; Dio-dorus 12.36.2. ²⁶Compare French *affiches*. ²⁷They are described by H. Diels and A. Rehm, *Paraepgmen-fragmente aus Milet*, *Sitzungsberichte der Königlich Preussischen Akademie der Wissenschaften*, 1904, Part I, 92-111. When a new fragment was found, this article was supplemented by A. Rehm, *Weiteres zu den Milesischen Paraepgmen*, *ibid.*, 752-759. ²⁸They are collected by H. Diels, *Die Fragmente der Vorsokratiker*, 1.390-393 (Berlin, 1906).

²⁹Carolus Manitius, *Gemini Elementa Astronomiae*, 210-233 (Teubner edition, Leipzig, 1898). ³⁰J. L. Heiberg, *Claudii Ptolemaei Opera Quae Extant Omnia*, 2.1-67 (Teubner edition, Leipzig, 1907). ³¹This can be found in the *Addenda* to A. W. Mair's translation of Hesiod, *The Poems and Fragments*, 114-125 (Oxford, 1908). ³²The translation, so far as it survives, is to be found in *Poetae Latini Minores* (edition of Baehrens), 1.1-27. See A. S. Pease's note on Cicero, *De Divinatione* 1.13 (pages 78-79 of the work cited in Note 67). ³³The translation and his *Prognosticorum Reliquiae* are to be found in Alfrédus Breysig, *Germanici Caesaris Aratea Cum Scholiis* (Teubner edition, Berlin, 1867). ³⁴See the edition of Alfrédus Breysig, *Rufi Festi Avieni Aratea* (Teubner edition, Leipzig, 1882). ³⁵See Note 33. ³⁶451-453 (G. R. Mair's translation). See too the Scholium on Aratus 10. ³⁷Commenting on Vergil, *Georgics* 1.335, *caeli menses et sidera serva*, Servius says: *id est duodecim signa, quibus menses agnoscimus*. ³⁸Eustathius, Migne, *Patrologia Graeca* 18.720. ³⁹Manilius 2.657. Compare the uses of *articuli temporum* in Pliny 18.222, 351.

one season to another⁴⁰. Pliny⁴¹ states that Aries indicates the spring equinox, Cancer the summer solstice, Libra the autumnal equinox, Capricorn the winter solstice. Varro⁴² represents spring as beginning when the sun is in Aquarius, summer when it is in Taurus, fall when it is in Leo, and winter when it is in Scorpio.

The rising and the setting of the Pleiades served to divide the year into two parts⁴³, and were in fact signs of the advent of summer and of winter⁴⁴. As we shall see, Arcturus made an equally satisfactory division. Even the hour of the night might be learned from the position of Orion in the sky⁴⁵.

GENERAL SIGNS

When the entire sky is equally bright at the *articuli temporum*⁴⁶, the autumn will be clear and cold; if spring and summer have passed not without some cold, they will make the autumn clear and settled and less windy; a clear autumn will make a windy winter⁴⁷.

The rising and the setting of stars together with the disturbances attending these movements cause now cold, now rain, now other kinds of injury to the earth⁴⁸. Often before the advent of rain a darkening halo appears about a star⁴⁹. After bad weather the stars are brilliant and their outline clear⁵⁰.

But when the clear light from the stars is dimmed, though no thronging clouds veil, nor other darkness hide nor Moon obscure, but the stars on a sudden thus causelessly wax wan, hold that no more for sign of calm but look for storm⁵¹.

The flashing⁵² of stars means winds from definite directions; but, if they flash in different places, they announce uncertain winds and from all directions. It was a commonplace to remark on the return of clear weather that the influence of such and such a constellation had terminated⁵³.

SHOOTING STARS AND COMETS

The appearance of many shooting stars (meteoric showers) is a sign of wind or rain, which will come from the same quarter from which the stars appeared⁵⁴. When such stars appear on all sides, there will be winds from every quarter⁵⁵. Lydus is very explicit, stating

⁴⁰Pliny 18.222.

⁴¹18.221. Compare Manilius 2.265-269, 656-659. Elsewhere the setting of Lyra is made the beginning of autumn (Varro ap. Plinius 18.296: compare 289). Pliny 18.221 is about the same as the Scholium on Aratus 462. See too the Scholia on Aratus 231, 233, and Geoponica 1.12.1.

⁴²Apud Geoponica 1.1.2-5.

⁴³Theophrastus 6; Pliny 18.280; Scholia on Aratus 264, 266.

⁴⁴Aratus 266-267; Scholium on Apollonius, Argonautica 3. 225; Pliny 2.123, 125; Isidore 3.71.13; Hyginus, Astronomicon 2.21.

⁴⁵Scholium on Aratus 730.

⁴⁶I. e. the two equinoxes and the two solstices. I do not see how any of them except the autumnal equinox could be even popularly associated with the weather of autumn.

⁴⁷Pliny 18.351. See also Theophrastus 44, 48, 56.

⁴⁸Seneca, Naturales Quaestiones 2.11.2.

⁴⁹Aratus 938-941; Pliny 18.353. ⁵⁰Vergil, Georgics 1.393-395.

⁵¹Aratus 1013-1018 (Mair's translation). Compare 1091, and Pliny 18.352.

⁵²In the source for this sentence, Pliny 18.352, the text as restored in the 1892 Teubner edition reads *si coruscabunt*. As far as the sense is concerned, it seems to me that the reading of *G. cursitabunt*, fits better. I suspect that *si cursitabunt* is a translation of some such word as *διαδρομαί*, or *διεκδρομαί*, and that shooting stars are meant. In 2.100 Pliny uses the expression *discursus stellarum*.

⁵³Pliny 18.208.

⁵⁴Theophrastus 13, 37; Aratus 926-929; Pliny 2.100, 18.351; Seneca, Naturales Quaestiones 1.1.11, 1.14.6; Lydus, De Ostentis 20, ad finem. See also Geoponica 1.11.9.

⁵⁵Theophrastus 37; Aratus 929-932.

that shooting stars from one direction mean wind from that quarter; from opposite directions, confusion of winds; from four quarters, all sorts of storms till thunder and lightning occur⁵⁶. The star which leaves a whitening trail or furrow behind is often mentioned, being a sign much observed by sailors⁵⁷.

From such a star arise squalls, and, if there is any air in a cloud it encounters, thunder occurs; if it breaks its way out in flames, there are thunderbolts; if it struggles on in a rather long course, there is lightning⁵⁸. If a circle (halo) encloses any of the planets, rain is indicated⁵⁹.

There is also considerable weather lore about comets, the 'long-haired' stars of the ancients. When they are frequent, they foreshadow wind and drought, according to Aristotle⁶⁰. At the time of the comet of 373-372 B. C. the winter was dry, and north winds prevailed⁶¹. Again, Aristotle associates a storm at Corinth with a comet that had appeared about the equinoctial circle for a few days in the archonship of Nicomachus (341-340 B. C.)⁶².

Seneca⁶³ feels impelled to warn his friend Lucilius that

the rising of a comet does not convey a threat of wind and rain in the immediate future, as Aristotle says, but casts suspicion over the whole year. Hence it is plain that the comet has not derived prognostications from its immediate surroundings to reveal for the immediate future, but that it has them stored up and buried deep within by the laws of the universe. The comet which appeared in the consulship of Paterculus and Vopiscus fulfilled the anticipations of this kind entertained by Aristotle, and for that matter by Theophrastus; for there were everywhere severe and prolonged storms, while in Achaia and Macedonia cities were overturned by earthquakes.

If the type of comet called *hippeus* looks toward the North, there will be a pestilential drought; but if it looks toward Bootes, there will be bitter cold as far as the Euxine Sea⁶⁴, and unusual storms will occur⁶⁵. When the kind called *lampadias* looks toward the East, it signifies a cloudy atmosphere⁶⁶.

When during violent storms stars (St. Elmo's fire) seemed to settle on the sails, sailors thought that they were being aided by Castor and Pollux. This was a sign that the storm was breaking and the wind abating, for otherwise the fires would flit about without falling⁶⁷.

PLANETS

Astrology taught that the period of the conjunction of heavenly bodies was attended by rain if it started in a section of the heavens corresponding to the moister

⁵⁶De Ostentis 9 D, page 27 of Wachsmuth's edition (Leipzig, Teubner, 1897).

⁵⁷Aratus 927, and Scholium; Vergil, Georgics 1.365-367; Lucan, Pharsalia 5.561-564; Seneca, Phaedra 747-748; Pliny 18.352. See also Iliad 4.76-77; Theocritus 13.49-52.

⁵⁸Pliny 2.112. ⁵⁹Pliny 18.352.

⁶⁰Meteorologica 1.7, 344 b. See too Theophrastus 34; Aratus 1091-1093; Seneca, Naturales Quaestiones 7.28.1.

⁶¹Meteorologica 1.7, 344 b. ⁶²345 a.

⁶³Seneca, Naturales Quaestiones 7.28.2 (Clarke's translation).

⁶⁴Evidently from the standpoint of Lydia.

⁶⁵Lydus, De Ostentis 12. See also Theophrastus 57.

⁶⁶Lydus, De Ostentis 14.

⁶⁷Seneca, Naturales Quaestiones 1.1.11. See also Pliny 2.101. For the bibliography of St. Elmo's fire see A. S. Pease, M. Tulli Ciceronis De Divinatione (University of Illinois Studies in Language and Literature), pages 224, 315-316, 475-476, 597, and note especially Jaisle, Die Dioskuren als Retter zur See (Tübingen, 1907).

portions of the earth, but that a conjunction over a place that was hot and dry might be expected to bring heat and dryness⁶⁸. With the assurance of one of our own almanacs the *Geoponica*⁶⁹ gives a great many interesting weather prognostics derived from the position of the planet Jupiter as it travels through the signs of the zodiac in a twelve-year cycle (*dodekaeteris*). It is stated, for instance, that, when Jupiter presses upon Aries in the house of Mars, Boreas will prevail for the entire year, not, however, to the exclusion of Eurus⁷⁰. Under such conditions the winter will be cold and snowy; there will be continual rains and flooded streams.

An elaborate list of the weather indications when each of the planets Saturn, Jupiter, Mars, Venus, and Mercury is dominant in any of the twelve signs of the zodiac is given in *Catalogus Codicum Astrologorum Graecorum* (4. 83-87). In the same work (7. 183-187) there is an equally impressive schedule of the weather to be expected when the moon is in any of the twelve signs during either June or July⁷¹. The weather signs of the sun and the moon are too extensive to be discussed here.

The planet Saturn is described by Vergil, *Georgics* 1.336, as *frigida Saturni stella*. There is considerable general weather lore connected with its Greek counterpart Kronos (and also with the god of the same name)⁷², but in Latin the emphasis is on chilly and wintry aspects⁷³. In commenting on the Vergilian line Servius says: *Ideo hoc dicit quia Saturnus deus pluviarum est, unde etiam senex fingitur: nam senes semper novimus esse gelidos*. I fail to see that the *unde*-clause is a logical consequence of the preceding words. To me it is a *non-sequitur*. Servius (on *Georgics* 3.104) knows of the confusion of *Kronos* and *chronos*, 'time', and he calls Saturn *deus... aeternitatis et saeculorum*. He may have known also of the Greek proverb, 'Older than Kronos', to signify a person exceedingly old. It seems clear that the association of Kronos with old age is due simply to the great antiquity of the god and to the confusion of his name with the Greek word for time. I have not been able to find record of any piece of sculpture or of any vase-painting which represents Saturn as a rain-god in the guise of an old man. The word *etiam* in the *unde*-clause indicates that Servius himself

thought the circumstance somewhat strange. I am wondering whether Servius looked upon the representation of the aged rain-god, or rather the rain-spirit, upon the Antonine Column as that of Saturn. It is pretty certain that at the time the Column was erected the figure was not regarded as that of Jupiter or of the Christian deity, or in fact of any special god⁷⁴.

In the remainder of this paper I shall record typical beliefs about the weather and agricultural associations of certain stars. The material is so diverse and miscellaneous that I am unable, in brief compass, to do much more than catalogue it.

PLEIADES (= VERGILIAE)

Since with the heliacal rising of the Pleiades in May the sea became less subject to storm and travel by ship was regarded as safe, the Greeks associated the name Pleiades with the verb meaning 'to sail' (*plein*), and popularly regarded these stars as 'The Sailors'⁷⁵. There is one ancient myth which says that the Pleiades are the star transformations of the *peleiades*, the pigeons that nourished Zeus⁷⁶, and legends of wild pigeons show numerous traces of the mythical astronomy of the Pleiades⁷⁷. It is noteworthy that the *peleiades* were likewise regarded as harbingers of summer and winter⁷⁸.

Leaf⁷⁹ thinks it possible that the stars are a 'flight of doves fleeing, like the Bear, from before the hunter Orion'. The Romans derived the word *Vergiliae* from *ver*, 'spring', because the Vergiliae rose in the spring⁸⁰.

Since this constellation appeared and disappeared at seasons that favored certain kinds of work and stopped others, it regulated many kinds of activities. Its rising reawakened human energy. As already indicated, then began the open season for sailing⁸¹. Vegetius⁸² says that from that time till the rising of Arcturus sailing was supposed to be safe because the severity of the winds was mitigated by the tempering influence of summer.

The rising of the Pleiades was the signal that the first of the three seed-times had arrived⁸³, and that grain which had been sown the preceding fall should be harvested⁸⁴. At this time special attention was given to fig-trees in order that they might hold their fruit⁸⁵. The period was so significant that both Democritus among the Greeks and Sextius among the Romans predicted 'futures' in olive oil⁸⁶. Since this was the

⁶⁸Hermippus, *De Astrologia* Dialogus 2.9.

⁶⁹1.12. Somewhat similar material is to be found in abundance in *Catalogus Codicum Astrologorum Graecorum*, 2. 144-152; 5. 172-179; 8, Part 3, 189-190.

⁷⁰1.12.3.

⁷¹Scattered bits of weather lore of planets are as follows: Mars is subject to uncertain winds and thunderbolts (Lucan, *Pharsalia* 10.206). When Saturn is in Capricorn, there are rains and thunderbolts; when it is in Scorpio, there are winds (Servius on Vergil, *Georgics* 1.336). The transit of Saturn causes rains (Pliny 2.106).

Under the caption *Stars Held Sure Index to Weather*, *The New York World* for July 7, 1925 published similar ideas in its magazine section.

⁷²See Cook, *Zeus* 2.557-558. An important and lengthy reference is *Catalogus Codicum Astrologorum Graecorum*, 4. 83-84. See also 2.161 and 7.214.

⁷³E. g. *frigida Saturni stella*, Vergil, *Georgics* 1.335 (compare Pliny 18.209); *Iovis stella inter Martis ferventissimam et Saturni frigidissimam*, Vitruvius 6.1.11; *frigida Saturni glacies et zona nivalis*, Lucan, *Pharsalia* 10.205-206; *Saturni sidus gelidae ac rigentis naturae*, Pliny 2.34; *Saturni stella frigida*, Censorinus, *Fragment* 3.3 (ed. Hultsch). In his note on *Georgics* 1.12 Servius describes Saturn as *humoris totius et frigoris deus*. Hermippus, *De Astrologia* Dialogus 13.79-80 (Teubner edition, pages 18-19), says that, since Saturn was a cold star, it had associated with it old age, which was regarded as physically cold and sluggish.

⁷⁴For the literature of the subject see *THE CLASSICAL WEEKLY* 18.165, Note 176.

⁷⁵Servius and Probus on Vergil, *Georgics* 1.138. See also Hesiod 615, 618; Scholium on Aratus 254.

⁷⁶Moero, as quoted by Athenaeus 11.491 b.

⁷⁷See Thompson, *A Glossary of Greek Birds*, 132 (Oxford, 1895).

⁷⁸Athenaeus, 11.491 b.

⁷⁹On *Iliad* 18.486. See too J. Ilberg, s. v. *Pleiades*, in Roscher, *Ausführliches Lexikon der Griechischen und Römischen Mythologie*, 3.2551.

⁸⁰Servius on Vergil, *Georgics* 1.138; Hyginus, *Astronomicon* 2.21; Scholium on Germanici Caesaris *Aratea*, page 149 of A. Breyssig's edition (Teubner, 1867); Festus 510-511 (Lindsay's edition); Isidore, *Origines* 3.71.13.

⁸¹Valerius Flaccus 5.46; Isidore, *Origines* 3.71.13; Servius on Vergil, *Georgics* 1.138. Theocritus 13.25-29 tells us that the Argo sailed at the rising of the Pleiades.

⁸²*De Re Militari* 4.39.

⁸³Theophrastus, *Historia Plantarum* 6.5.1; Pliny 18.223. Compare *Geoponica* 2.14.3.

⁸⁴Hesiod 383-384; Eustathius in Migne, *Patrologia Graeca* 18.720. See also Scholium on Aratus 11.

⁸⁵*Geoponica* 10.48.4.

⁸⁶Pliny 18.273-274.

sprouting season for olives and for vines⁸⁷, conditions were going to be very hard upon them if rain occurred⁸⁸. Their cultivation and likewise their harvest were regulated with reference to the Vergiliae⁸⁹, which were regarded as their constellation⁹⁰. Tillage of the vineyards ceased, however, when the 'house-carriers' (snails) climbed up plants in the middle of May to escape the Pleiades⁹¹.

Another industry that started in Italy with the rise of the Vergiliae was cheese-making⁹². Fishermen, too, became busy, for eels were taken in greatest abundance at this time⁹³, and tunnies could be caught from this time until the setting of Arcturus⁹⁴.

Bees, which had ceased their work for the winter with the setting of the Vergiliae, renewed activity after their rising⁹⁵. In Italy, as in Greece⁹⁶, the movements of this constellation were the time-table for the activities of bee-culture⁹⁷. Apiarists gathered a yield of honey both at their rising and at their setting⁹⁸.

Many tasks were to be performed at the setting of these stars⁹⁹. Fall plowing and sowing were to start at this time¹⁰⁰. Vergil¹⁰¹ advised that wheat and spelt be sown at this period; Pliny¹⁰² recommends that wheat and barley be sown then. Among the leguminous plants which were to be sown before their setting¹⁰³, Varro¹⁰⁴ specified beans.

A few duties were scheduled as appropriate after their setting: the pruning of vines¹⁰⁵ and trees¹⁰⁶, and planting (as opposed to sowing)¹⁰⁷. Varro¹⁰⁸ recommended that grapes be gathered and wine made between the autumnal equinox and the setting of the Pleiades, while vines should be pruned and trees propagated and planted immediately afterward¹⁰⁹. In short, the six months during which the Vergiliae were visible marked the period in which the productive forces of nature were in operation¹¹⁰.

The setting of the Pleiades was a common sign of storm¹¹¹. We find applied to them many adjectives meaning 'stormy'¹¹², 'rain-bearing'¹¹³, 'dripping'¹¹⁴,

'moist'¹¹⁵, 'watery'¹¹⁶, 'fierce'¹¹⁷, 'cloudy'¹¹⁸. They checked navigation after the month of November¹¹⁹. There are many references to the disturbances they caused upon the sea¹²⁰. Hesiod¹²¹ thus adjures his brother:

When the Pleiades plunge into the misty sea to escape Orion's rude strength, then truly gales of all kinds rage. Then keep ships no longer on the sparkling sea, but bethink you to till the land as I bid you.

As might be expected, they hampered military operations. When Hannibal's men arrived at the summit of the Apennines, already worn out by numerous hardships, a snowfall at the setting of the Vergiliae caused great terror¹²².

It was believed that¹²³

... whatever is the condition of the atmosphere when the Pleiad sets, that it continues in general to be till the winter solstice, and, if it does change, the change only takes place after the solstice: while, if it does not change, it continues the same till the spring equinox: the same principle holds good from that time to the rising of the Pleiad, from that again to the summer solstice, from that again to the autumnal equinox, and from that to the setting of the Pleiad.

Wide-awake merchants, especially tailors, took advantage of this (supposed) knowledge. When a cloudy setting proclaimed a rainy winter, they increased the price of goods. When a clear setting signified a bitter winter, the price of other kinds of clothes soared¹²⁴.

ARCTURUS

Arcturus, the brightest star in Bootes, aroused the utmost fear¹²⁵. Its rising was fraught with very special significance for five days both on land and on sea¹²⁶. On setting too, as well as on rising, it caused the worst kind of storms¹²⁷. Its appearance might be attended by hail¹²⁸, winds¹²⁹, or showers¹³⁰. Rains would not prevail throughout Arcturus, however, if they occurred at the setting of the Dolphin¹³¹. A lack of rain at the rising of the Dog-Star or of Arcturus meant as a rule that there would be wind or rain toward the equinox¹³². Swallows, too, feared the rising of Arcturus, since they perished if they did not depart in time to anticipate

⁸⁷Pliny 16.104, 18.287.

⁸⁸Pliny 17.11. ⁸⁹Pliny 17.130, 188, 18.319. ⁹⁰Pliny 17.11.

⁹¹Hesiod 571-573. Compare Pliny 18.280. ⁹²Varro 2.11.4.

⁹³Pliny 9.74. ⁹⁴Pliny 9.53. ⁹⁵Pliny 11.13. Compare 11.43.

⁹⁶Aristotle, *Historia Animalium* 5.22.4.

⁹⁷Pliny 11.43; Columella 9.14.1, 4, 5, 11, 13.

⁹⁸Vergil, *Georgics* 4.231-235. See T. E. Page's note ad loc.

For three periods of taking honey see Varro 3.16.34, and *Geoponica*

15.5.1.

⁹⁹Pliny 18.320: ... quaeque a Vergiliarum occasu agi debent.

¹⁰⁰Hesiod 384-385; Aratus 267; Theophrastus, *Historia Plantarum*

8.1.2; Pliny 18.49, 201, 223, 280. In Hesiod 614-616 the

Hyades and Orion are linked with the Pleiades.

¹⁰¹*Georgics* 1.219-222. See also Pliny 18.202; Columella 2.8.1;

Eustathius in *Migne*, *Patrologia Graeca* 18.720.

¹⁰²18.49. See also 17.131.

¹⁰³Pliny 18.120. See also Theophrastus, *De Causis Plantarum*

3.23.1.

¹⁰⁴1.34.2.

¹⁰⁵Theophrastus, *De Causis Plantarum* 3.13.2; *Geoponica* 9.9.5.

¹⁰⁶Theophrastus, *De Causis Plantarum* 3.7.10.

¹⁰⁷*Ibid.* 3.4.1. Another period for this operation was from the

spring solstice to Arcturus (*ibid.*). See also *Geoponica* 10.2.2, 10.

85.2, 3.13.2.

¹⁰⁸1.34.2.

¹⁰⁹In connection with the relation of the Pleiades to agricultural

operations one should consult Sir James G. Frazer, *Spirits of the*

Corn and of the Wild, 1.307-319 (London, 1919).

¹¹⁰Pliny 18.280.

¹¹¹Horace, *Carmina* 4.14.20-22; Ovid, *Ars Amatoria* 1.409;

Valerius Flaccus 5.415; Hilarius, In *Genesis* 69 (*Corpus Scrip-*

torum Ecclesiasticorum Latinorum 23.233). Contrast *Propertius*

2.16.51.

¹¹²Hesiod, as quoted by Athenaeus 11.491 d.

¹¹³*Imbrifera*... *sub Pleiade*, Lucan, *Pharsalia* 8.852.

¹¹⁴*Madida cadente Pleiade*, Claudian 8.437-438. Compare Avi-

enus 1805.

¹¹⁵*Pleias uda*, Ovid, *Fasti* 5.664.

¹¹⁶*Pliadae aquosae*, Statius, *Thebais* 4.120.

¹¹⁷*Aspera Pleias*, Valerius Flaccus 2.405-406.

¹¹⁸*nubila Plias*, Statius, *Silvae* 3.2.76. Compare *Pliada lege poli*

nimboso moverat astro, Valerius Flaccus 2.357; *nimbis soluta Plias*,

Statius, *Silvae* 1.6.21-22.

¹¹⁹Vegetius, *De Re Militari* 4.39.

¹²⁰Ovid, *Heroides* 17.188, *Ex Ponto* 2.7.58; Valerius Flaccus

2.406, 4.269, 5.305; Manilius 1.371; Seneca, *Hercules Furens* 10;

Claudian 26.209; Claudius Rutilius Numatianus, *Itinerarium*

1.167.

¹²¹619-623 (H. G. Evelyn-White's translation). An echo of this

passage is to be found in Quintus Smyrnaeus 5.367-369.

¹²²Livy 21.35.6; Polybius 3.54.1. See also *Bellum Africanum* 47;

Quintus Curtius Rufus 5.6.12.

¹²³Theophrastus 7 (Hort's translation). Compare *Geoponica*

1.5.2.

¹²⁴Pliny 18.225.

¹²⁵*signum*... *acerrimum*, Plautus, *Rudens*, Prologue 70. It is

called *vehementissimum* by Vegetius, *De Re Militari* 4.39.

¹²⁶Pliny 18.310.

¹²⁷... cuius ortus et occasus tempestates gravissimas facit,

Servius on Vergil, *Georgics* 1.204; Vergil, *Georgics* 1.67-68;

Aratus 744-745; Scholium on Aratus 744; Scholium on Apollonius

Rhodium 2.1098; Pliny 18.278; Columella 11.2.21, 43, 58; Am-

pelius, *Liber Memorialis* 2; Scholia Basileensia on Germanicus

Caesaris Aratea, Breysig's edition, page 67 (Berlin, 1867).

¹²⁸Pliny 2.106.

¹²⁹Columella 11.2.21, 63, 65; Claudian 21.123. The setting, too,

was attended by wind: Columella 11.2.45, 78.

¹³⁰Pliny 17.230. ¹³¹Pliny 18.311. ¹³²Theophrastus 23.

this event. Their departure was, in fact, an indication of the rising of this star¹³³.

It was especially dangerous to be sailing while Arcturus was rising¹³⁴. Dion's expedition against Dionysius and Syracuse encountered a severe storm during which

a boisterous wind from the north rushed down upon them, raised a great sea, and drove the ships away from Sicily, while flashes of lightning and peals of thunder, now that Arcturus was just rising, conspired to pour down from the heavens a great storm of furious rain¹³⁵.

A monument to a victim of the blasts of Boreas begins with the significant sentence: 'Hateful to sailors is a voyage at the time of Arcturus'¹³⁶. It was a rash man who refused to heed Plaustrum and Arcturus and who despised Bootes¹³⁷. Though Arcturus was violent on rising, it was still more violent on setting. In the Prologue of the *Rudens*¹³⁸ of Plautus Arcturus says:

nam signum Arcturus omnium sum acerrimum:
vehemens sum exoriens, quom occido vehementior.

Many of the spring and fall activities upon the farm were regulated by Arcturus. Its setting indicated the season for plowing¹³⁹, and for sowing vetch, kidney-beans, and lentils¹⁴⁰. One of the four periods of germination of trees was at this time¹⁴¹. Mago advised planting almonds from its setting to the winter solstice¹⁴². If timber had to be cut a little prematurely, it was best to do so at the setting of this star and before the rising of Fidicula¹⁴³.

The period for transplanting thyme from the hotbed to the garden was from the blowing of Favonius to Arcturus¹⁴⁴. Hemp, however, was sown at its rising¹⁴⁵. If land was not productive, the best procedure was to turn it over with a shallow furrow just before the appearance of Arcturus¹⁴⁶.

When rosy-fingered Dawn sees Arcturus, then it is the time to harvest grapes¹⁴⁷. Between this time and the coming of the swallow the vines should be pruned¹⁴⁸.

In Greece, bees sleep from the winter solstice till the rising of Arcturus, from which time till the vernal equinox they are awake and live on the food stored up for this period¹⁴⁹. Columella¹⁵⁰ says that at the rising of Arcturus bees begin to make honey, and that between the appearance of Canicula and that of Arcturus drones must be kept from attacking workers issuing from the hives. According to Varro¹⁵¹, there are three periods of taking honey from the bees, one of which is before Arcturus becomes entirely visible. The least desirable honey, a wild variety, was produced for the most part at the rising of Arcturus¹⁵².

¹³³Pliny 18.311. Contrast Columella 9.14.17-18.

¹³⁴Aratus 744-745; Ovid, *Ex Ponto* 2.7.57; Manilius 5.358; Solinus 11.25.

¹³⁵Plutarch, *Dion* 25.3 (Perrin's translation).

¹³⁶Anthologia Graeca 7.495.

¹³⁷Claudian 15.501-504.

¹³⁸69-70. Compare Horace, *Carmina* 3.1.27-28 *saevus Arcturi cadentis impetus*.

¹³⁹Pliny 18.137. Compare 17.134.

¹⁴⁰Vergil, *Georgics* 1.227-229; Pliny 18.202 (compare 120). In these passages Vergil and Pliny use the name of the constellation to which Arcturus belongs, Bootes.

¹⁴¹Pliny 16.99. ¹⁴²Pliny 17.131. ¹⁴³Pliny 16.188.

¹⁴⁴Varro 1.35.2. Compare *Geoponica* 9.11.6.

¹⁴⁵Columella 2.10.21; *Geoponica* 2.40.2.

¹⁴⁶Vergil, *Georgics* 1.67.

¹⁴⁷Hesiod 610-611. ¹⁴⁸Hesiod 564-570. ¹⁴⁹Pliny 11.43.

¹⁵⁰9.14.10. ¹⁵¹3.16.34. ¹⁵²Pliny 11.41.

The season for mating sheep extended from the setting of Arcturus to that of Aquila¹⁵³; lambs conceived later were puny and weak¹⁵⁴. The shepherds who pastured their flocks upon Cithaeron regarded the appearance of Arcturus as a signal that their six months' sojourn was at an end and that they should drive their flocks to their winter folds¹⁵⁵⁻¹⁵⁶.

(To be concluded)

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REVIEWS

Horace at Tibur and the Sabine Farm. By G. H. Hallam. Harrow, England: Harrow School Bookshop (1923). Pp. 24.

The combination within so few pages of the entertaining and the erudite which meets us in Mr. G. H. Hallam's book, *Horace at Tibur and the Sabine Farm*, might be a bit puzzling were it not explained in the Preface (4-5). There we read that the material here presented was first arranged for a "talk" to accompany a set of lantern-slides sponsored by the Roman Society and the Hellenic Society (of Great Britain) in the hope of attracting boys and girls of Secondary Schools to whom Latin and Greek had hitherto been a sealed book. "It was laid down that the pictures should be beautiful and attractive in themselves, and that the 'talks', though composed by competent scholars, should not be technical or abstruse". Hence we find a little outline of Horace's life, facts familiar to anyone who has read anything of him or about him, a pleasant poem or two relating to Horace, some discussion of Horace's art, a number of excellent illustrations from photographs and drawings, two clear little maps (of the Anio Valley, and of Tibur), and some archeological description and exposition. It is in this last mentioned item especially that we find matter which seems to transgress a little the bounds laid down in the Preface prohibiting the technical; but perhaps this is due to the fact that the original "talk" was modified to be given without slides before the Anglo-American Archaeological Society of Rome, in the Villa of Horace, at Tivoli, in April, 1923, and it is in this form that it is printed.

Thus printed it is more likely to serve a secondary purpose mentioned in the Preface, that of "guide to some who may visit Tivoli and the Valley of the Digentia". I should advise any such visitor, unless he has all that is known of the monuments and the topography of this district at his fingers' ends, or is accompanied by a really scholarly and specially equipped human guide, to have in his pocket a copy of this slender volume. The maps alone are worth the trouble of carrying the book.

The portion dealing with The Sabine Farm (8-15),

¹⁵³Pliny 8.187; Varro 2.1.18. ¹⁵⁴Varro 2.2.13.

¹⁵⁵Sophocles, *Oedipus Tyrannus* 1133-1139. See Jebb's note on pages 305-308 of his edition of this play.

¹⁵⁶Theophrastus, too, makes references to this star, e. g. *Historia Plantarum* 1.9.7, 1.14.1, 3.5.4, 9.8.2, *De Causis Plantarum* 1.6.3, 1.13.3, 5, 5.10.1, 6.8.1, 5.



The Classical Astral Weather Chart for Rustics and for Seamen (Concluded)

Author(s): Eugene S. McCartney

Source: *The Classical Weekly*, Vol. 20, No. 7 (Nov. 29, 1926), pp. 51-54

Published by: [Classical Association of the Atlantic States](#)

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The Classical Weekly

VOL. XX, No. 7

MONDAY, NOVEMBER 29, 1926

WHOLE No. 537

THE CLASSICAL ASTRAL WEATHER CHART FOR RUSTICS AND FOR SEAMEN

(Concluded from page 49)

THE DOG-STAR

The common Greek name for the Dog-Star is Sirius, but the Greeks called it *kyon* (Latin *canis*) also, and had likewise a form *prokyon* (Latin *antecanis*). The Romans used both *canis* and *canicula* to designate Sirius, and only occasionally paid heed to the difference between it and *prokyon*¹⁵⁷. In only a comparatively small number of passages do Roman writers use the words *antecanis* and *procyon*.

The very name Sirius, 'Scorcher', is significant of the chief weather association of this star¹⁵⁸. Its baneful influence was felt most when it rose with the sun, for then it made the heat of the sun twice as great, and caused human beings to be affected with languor¹⁵⁹. Manilius¹⁶⁰ says that *canicula* 'barks flames and raves with his own fire and doubles the heat of the sun'. Its evil reputation was firmly established in heroic days, for Homer¹⁶¹ calls it a very bright star and describes it as bringing fiery heat to mortals.

Its most diligent observers were the people of Cos. If it arose obscure and clouded, they concluded that the year would be heavy and pestilential; if it rose bright and shining, they inferred that the air would be pure and the weather salubrious¹⁶². The rising of the Dog-Star used to parch the Cyclades and cause drought until the people of Cos summoned Aristaëus to their aid. He taught them to make sacrifice to the star, as a result of which refreshing Etesian winds blew for forty days¹⁶³.

The Dog-Star rose at the hottest part of the summer, and its effects were felt on land and on sea¹⁶⁴. No star has had its weather-making characteristics described in a greater variety of ways, e. g. by such words as *acer*¹⁶⁵, *aestifer*¹⁶⁶, *aestivus*¹⁶⁷, *fervidus*¹⁶⁸, *flagrans*¹⁶⁹,

*fulgens*¹⁷⁰, *ignicomans*¹⁷¹, *portans incendia*¹⁷², *siccus*¹⁷³, *sitiens*¹⁷⁴, *sitim ferens*¹⁷⁵, *torrens*¹⁷⁶, *torrentior*¹⁷⁷.

There are other descriptions of a somewhat general character, e. g. *aestivum sidus*¹⁷⁸, *calidum sidus*¹⁷⁹, *sidus vehemens*¹⁸⁰, *rabiosum signum*¹⁸¹, *rabies canis*¹⁸², *implacido letalis Sirius igni*¹⁸³, *laevus ignis*¹⁸⁴, *laevum lumen*¹⁸⁵, *agente terra per caniculum rimas siticulosam sustinemus aestatem*¹⁸⁶, *Calabri populator Sirius arvi*¹⁸⁷.

If no rain fell at the rising of the Dog-Star or at that of Arcturus, rain or wind generally occurred toward the equinox¹⁸⁸. The setting of the Dog-Star, likewise, affected the weather¹⁸⁹. In order to base long-range predictions upon its rising, one must observe in what 'house' Luna is. If the moon is in Sagittarius, the year will be rainy; if it is in Capricorn, there will be an abundance of rain; if it is in Aquarius, there will be but little rain; if it is in Pisces, there will be many rains; if it is in Aries, there will be a great amount of rain; if it is in Taurus, there will be many rains and hailstorms; if it is in Cancer, there will be dry spells¹⁹⁰.

The first thunder heard in each year after the Dog-Star had risen gave many indications of the future, if one observed in what sign Luna happened to be. If Luna was then in Cancer, the thunder meant, among other things, drought, but an abundance of rain some time in March or in April; if Luna was in Virgo, the thunder meant danger for those at sea; if Luna was in Capricorn, there were to be rains for fifty days¹⁹¹.

In *Fasti* 4¹⁹² Ovid says that the rising of the Dog-Star is coincident with the disappearance of Aries, and that it occurs in the midst of spring. This is an error. Valerius Flaccus¹⁹³ speaks of the 'fierce dog of Autumn'. He is doubtless misled by the Homeric *opora*¹⁹⁴, which in the *Iliad* refers to the harvest season in July. For the Egyptians the rising of the Dog-Star marked the beginning of the sacred year¹⁹⁵.

¹⁵⁷See Haebler in Pauly-Wissowa, Real-Encyclopädie der Classischen Altertumswissenschaft, s. v. *Canis*, 3.1481 (1899). He holds that Pliny 18.268, and perhaps Hyginus, *Astronomicon* 2.4, are the only Latin authors who use *canicula* for *prokyon*.

¹⁵⁸See Aratus 326-337; Scholium on Apollonius Rhodius, *Argonautica* 517; Isidore, *De Natura Rerum* 26.14.

¹⁵⁹Scholium Stroziana on Germanici Caesaris Aratea, Breysig's edition, 167 (Teubner, 1867). For its effects on human beings, beasts, and vegetation, see Gundel, as cited in Note 1, pages 132-139 (the page numbers in the inside margin are 40-47). See also Quintus Smyrnaeus 8.28-31.

¹⁶⁰5.207-208. Read also as far as 230.

¹⁶¹*Iliad* 22.30-31. Compare Quintus Smyrnaeus 8.28-31.

¹⁶²Cicero, *De Divinatione* 1.130. Compare Manilius 1.401-404.

An important reference is Hephaestion Thebanus 1.23.

¹⁶³Scholium on Apollonius Rhodius 2.498, 525; Diodorus 4.82.3-5; Hyginus, *Astronomicon* 2.4; Clement of Alexandria, *Stromata* 6.3.29 (2.444-445, in Stählin's edition); Nonnus, *Dionysiaca* 5.269-279. On the Etesian Winds see Aristotle, *Meteorologica* 2.5, 362 a. Much information is contained in A. S. Pease, as cited in Note 67, page 327, and in Sir James G. Frazer, *Adonis, Attis, Osiris*, 2.35, Note 1 (London, 1914).

¹⁶⁴Pliny 2.107, 123, 9.58, 18.268, 270.

¹⁶⁵Valerius Flaccus 6.607. ¹⁶⁶Seneca, *Oedipus* 39; Vergil, *Georgics* 2.353. Compare Martinius Capella 2.98.

¹⁶⁷Tibullus 1.4.6, 3.5.2. See also 1.1.27, 1.4.42.

¹⁶⁸Cicero, *Aratorum Reliquiae* 108, 462. ¹⁶⁹Horace, *Carmina* 3.13.9.

¹⁷⁰Martianus Capella 2.98. ¹⁷¹Avienus, *Aratea Phaenomena* 1112.

¹⁷²Manilius 5.17. ¹⁷³Propertius 2.28.4.

¹⁷⁴Ovid, *Ars Amatoria* 2.231. ¹⁷⁵Vergil, *Aeneid* 10.274.

¹⁷⁶Vergil, *Georgics* 4.425. ¹⁷⁷Claudian 11.20.

¹⁷⁸Ovid, *Haliutica* 117. ¹⁷⁹Tibullus 2.1.47. ¹⁸⁰Pliny 18.285.

¹⁸¹Horace, *Serm.* 1.6.126. This is the regular reading in the manuscripts, but it is not used in modern editions. See E. C. Wickham's note ad loc.

¹⁸²Horace, *Epistulae* 1.10.16. ¹⁸³Statius, *Silvae* 2.1.216.

¹⁸⁴Statius, *Thebais* 1.634-635. ¹⁸⁵Vergil, *Aeneid* 10.275.

¹⁸⁶Priapea 63.2-3. ¹⁸⁷Valerius Flaccus 1.683.

¹⁸⁸Theophrastus 23. Compare Ovid, *Fasti* 4.904, and Columella 11.2.53. See also G. H. Hallam's note on Ovid, *Fasti* 4.822 (904 in the Teubner edition).

¹⁸⁹Columella 11.2.37, 89, 94.

¹⁹⁰Geoponica 1.8.1, 6, 7, 8, 9, 10, 11, 13. For an important and lengthy reference of similar character, see *Catalogus Codicum Astrologorum Graecorum*, 4.154-155.

¹⁹¹Geoponica 1.10.1, 5, 7, 11.

¹⁹²Lines 901-903. See G. H. Hallam's note on Ovid, *Fasti* 4.822.

¹⁹³6.607. ¹⁹⁴5.5: 22.27.

¹⁹⁵Censorinus, *De Die Natali* 18.10, 21.10; Porphyrius, *De Antro Nymphaeum* 24; Hephaestion Thebanus 1.23; W. Dittenberger, *Orientis Graeci Inscriptiones Selectae*, 1.102, No. 56. Contrast Scholium on Aratus 754.

According to Theophrastus¹⁹⁵, the rising of the Dog-Star marked one of the three seasons for sowing, but Pliny¹⁹⁷, with different conditions in mind, says that the time for planting, aside from spring and fall, was approximately the time of the rising of this star, and adds that the precise time for planting was known to but few persons, since the star was not believed equally useful in all places. The rising of the Dog-Star was one of the three periods of sprouting vegetation¹⁹⁸ and likewise one of the three times for cultivating the vineyard¹⁹⁹. In addition to the spring period for the germination of trees, there were three others all of which were determined by the stars, the winter at the rising of Aquila, the summer at that of the Dog, the third at that of Arcturus²⁰⁰.

With the rising of the Dog-Star south winds began to prevail in Italy²⁰¹, and heat-waves killed grafts and young trees²⁰². It was, however, according to some persons, the best period to cut timber²⁰³. *Dolia* should then be smeared with tar or with pitch²⁰⁴. Must was allowed to ferment in the sun for forty days after the rise of the Dog-Star²⁰⁵. At this period, too, wine turned and became sour²⁰⁶.

At about this time irrigation was practised, with care exercised to avoid immoderate soaking of roots²⁰⁷. It was the general season for harvesting frankincense²⁰⁸, and, in Assyria, for transplanting young growths²⁰⁹⁻²¹⁰.

HAEDI

The Haedi or Kids have many of the characteristics of the Pleiades and of Arcturus, and are in fact often mentioned in the same breath with them. They are called both rainy²¹¹ and cloudy²¹², and are harbingers of storm²¹³, and also the cause of storms both at their rising and at their setting²¹⁴. The Kids and the Goat, which shine beside the great hand of the Charioteer, are eminent beyond all his other limbs in raising storms when they fare with the sun²¹⁵. An epigram of Callimachus²¹⁶ advises the mariner to flee the sea when the Kids are setting. Often on the deep have the Kids seen men tossed about²¹⁷.

Capella (Capra), too, is both rainy²¹⁸ and a sign of rain²¹⁹. The shipman dreads the deep when the sun and the Goat-Star meet²²⁰. When the Goat-Star was rising, it did great injury to vines. In order to avert this, the people of Phlius set up a bronze statue of a goat in their *agora*, and adorned it with gold²²¹.

¹⁹⁵As quoted by Varro 1.40.3. ¹⁹⁷Pliny 17.132.

¹⁹⁸Pliny 17.134. ¹⁹⁹Pliny 17.188. ²⁰⁰Pliny 16.99.

²⁰¹Pliny 10.45. Compare 2.124. ²⁰²Pliny 17.222.

²⁰³Pliny 16.191. ²⁰⁴Pliny 14.134. ²⁰⁵Pliny 14.85.

²⁰⁶Geoponica 7.10.1. ²⁰⁷Pliny 17.249. ²⁰⁸Pliny 12.58.

²⁰⁹Pliny 13.37.

²¹⁰For similar references see Theophrastus, *Historia Plantarum* 1.9.5, 3.5.4, 9.1.6; De Causis Plantarum 1.6.3, 6, 1.13.3, 5, 3.3.3, 3.16.2; Pliny 11.30, 36, 37, 14.118, 17.222, 19.45, 176, 22.45, 30.25.

²¹¹Vergil, *Aeneid* 9.668. Compare Claudian 15.497.

²¹²Ovid, *Tristia* 1.11.13. ²¹³Vergil, *Georgics* 1.205; *Aeneid* 9.663.

²¹⁴Servius on *Aeneid* 9.665, *Georgics* 1.205; Horace, *Carmina* 3.1.27; Pliny 2.106; Columella 11.2.66; *Scholia* on Aratus 679-681.

²¹⁵Aratus 679-682. See too *Scholium* on Aratus 158.

²¹⁶20. ²¹⁷Aratus 158-159. Compare Theocritus 7.53-54; *Metamorphoses* 1.365.

²¹⁸Ovid, *Metamorphoses* 3.594; Pliny 18.248.

²¹⁹*Signum pluviæ*, Ovid, *Fasti* 5.113. See too Columella 11.2.37, 63, 94.

²²⁰Quintus Smyrnaeus 2.533-534. Compare 1.355-356; Aratus 158.

²²¹Pausanias 2.13.6.

ORION

Orion, both rising and setting, was treacherous and stormy²²², and caused confusion on land and on sea²²³. A Roman fleet which met disaster in 255 B. C. was warned not to steer along the southern coast of Sicily both because of the lack of a safe anchorage and because of two dangerous stars, Orion, which had not yet set, and the Dog-Star, which had not yet risen²²⁴.

In its weather-making aspects Orion is described as *aquosus*²²⁵, *nautis infestus*²²⁶, *minax*²²⁷, *niger*²²⁸, *nimbosus*²²⁹, *nubilis*²³⁰, *procellosus*²³¹, *saevus*²³², *tristis*²³³, and *trux*²³⁴. At times Iugula, the star in Orion's belt, is mentioned in connection with the weather²³⁵.

Hesiod advised his brother to winnow grain when strong Orion first appeared²³⁶. Grapes were to be harvested when Orion reached mid-heaven²³⁷.

HYADES (= SUCULAE)

The word Hyades was translated into Latin by *Suculae*, 'Pigs'. Scholars both ancient²³⁸ and modern have been in the habit of regarding this rendering as an instance of popular etymology. There is, however, some tendency at the present time to consider the word Hyades as actually meaning 'Pigs'²³⁹. Whatever may be the real etymology, it is certain that the stars so designated were generally regarded as 'Rainers' both in name and in fact²⁴⁰. Vergil is obviously playing upon the name in the expression *pluviae Hyades*²⁴¹. Elsewhere they are described as *occasibus udae*²⁴² and *tristes*²⁴³. In the singular we find *Hyas inserena nimbis*²⁴⁴ and *nivosum sidus*²⁴⁵.

At both rising and setting the Hyades brought rain and generally stormy weather²⁴⁶. They were observed both by farmer and by seaman²⁴⁷. We are told that for the people of Egypt the *Suculae* set on the four-

²²²Aristotle, *Meteorologica* 2.5, 361 b. Just prior to this Aristotle states that calm is apt to prevail at the rising of Orion.

For other references see Aratus 729-731; Theocritus 7.54; Apollonius Rhodius 1.1202; *Anthologia Graeca* 7.293; Horace, *Carmina* 1.28.21, 3.27.17-18, *Epodes* 10.9-10; Pliny 18.223, 278; Statius, *Thebais* 3.27; Claudian 15.498.

²²³Isidore, *Origines* 3.71.10. ²²⁴Polybius 1.37.4.

²²⁵Vergil, *Aeneid* 4.52; Propertius 2.16.51.

²²⁶Horace, *Epodes* 15.7. ²²⁷Seneca, *Hercules Furens* 12.

²²⁸Statius, *Thebais* 9.461. ²²⁹Vergil, *Aeneid* 1.535.

²³⁰Claudian 21.287.

²³¹Claudius Rutilius Numatianus, *Itinerarium* 1.637.

²³²Vergil, *Aeneid* 7.719. ²³³Horace, *Epodes* 10.10.

²³⁴Avienus 249.

²³⁵Isidore, *De Natura Rerum* 26.8, *Origines* 3.71.11; *Scholium* on Aratus 754. The name appears at times in the plural form, *Iugulae*.

²³⁶597-599. ²³⁷609-611.

²³⁸E. g. Pliny 18.247 ... nostri, a similitudine cognominis Graeci, propter sues impositum arbitantes, inperitia appellavere suculas; Cicero, *De Natura Deorum* 2.111; Tiro in Aulus Gellius 13.9; Festus 390 (Lindsay's edition).

²³⁹Leaf, in his note on *Iliad* 18.486, inclines to the belief that it means 'Piglets'. See too Gundel, as cited in Note 1, 195.

²⁴⁰Compare Ovid, *Fasti* 5.166 *Navita* quas Hyadas Graius ab imbre vocat; Pliny, 2.106 ... quas Graeci ob id pluvio nomine appellant. See too *Scholium* on Aratus 172, and Hellanicus, *Frag.* 56 (in Müller, *Fragmenta Historicorum Graecorum*, 1.52).

²⁴¹*Aeneid* 1.744, 3.516; Seneca, *Medea* 311-312. In The Classical Journal 14.355 I have noted several similar instances. See also T. E. Page's note on *Aeneid* 3.516, and compare Tennyson, *Ulysses*: "Thro' scudding drifts the rainy Hyades Vext the dim sea".

²⁴²Claudius Rutilius Numatianus, *Itinerarium* 1.633.

²⁴³Horace, *Carmina* 1.3.14. ²⁴⁴Statius, *Silvae* 1.6.21.

²⁴⁵Statius, *Silvae* 1.3.95.

²⁴⁶Hellanicus, *Frag.* 56 (Müller, *Fragmenta Historicorum Graecorum* 1.52); Epitome XIV of Eratosthenis *Catasterismorum Reliquiae* (page 108 of the edition of Carolus Robert, Berlin, 1878); *Scholium* on *Iliad* 18.486; *Scholium* on Aratus 172; Tiro in Aulus Gellius 13.9.4; Pliny 2.110; Columella 11.2.35, 36, 39, 43, 88, 89.

²⁴⁷Ampelius, *Liber Memorialis* 3. For the danger of the Hyades to sailing, see Ovid, *Metamorphoses* 3.595, *Fasti* 5.166; Seneca, *Medea* 312.

teenth day before the Kalends of May; it was to them a stormy constellation and significant of bad weather both by land and by sea. Setting on the sixteenth day before the Kalends of May, according to the Attic calendar, on the fifteenth day, according to Caesar, it announces bad weather for four days in succession, a period which ends on the eleventh day before the Kalends of May. Clouds, too, were naturally associated with these stars²⁴⁸. While the rising of the Hyades brought a great downpour of rain, that of the Kids and Arcturus caused hail to accompany the rain²⁴⁹. Columella speaks of wintry weather as attending the setting²⁵⁰ of the Hyades.

The setting Hyades shared with the Pleiades and Orion the honor of ushering in the plowing season²⁵¹. The period for the planting of olives extended from the setting of the Hyades to the winter solstice²⁵².

CONCLUSION

The psychology of much of this weather lore is perfectly obvious. It happened that there were seasonal changes at the time certain stars and constellations were rising or setting. This coincidence gave rise to the belief that the stars caused the change. Periods of transition and change in the world above were supposed to aid or effect changes below. This is the principle of 'sympathy'.

Though it seems perfectly obvious to us that conditions true for one time and for one country might not be applicable to another period and to another place, this fact was not so clear to the ancients. Statements were blindly repeated without regard to the situation under which they originated²⁵³.

The collection of material in this paper is merely representative. It would be impossible to collect all the references without ransacking the entire body of classical literature. I have avoided all reference to the different kinds of risings and settings, and, in fact, many other space-consuming discussions suggested in various connections. Collateral material can readily be found in the handbooks, for example in the article on *Astronomia* in Smith's Dictionary of Classical Antiquities, but many facts have been ascertained since it was written.

It is a difficult matter for one who has not lived in the country and seen farmers handling cheap editions of almanacs to understand just what place this kind of material had in the lives of the ancients. Even with this experience it is sufficiently difficult to reconstruct an accurate picture. At all events this paper on weather lore calls attention to the less formal side of the ancient character, the field of classical study in which I am most interested.

²⁴⁸Pliny 18.247. ²⁴⁹Lydus, *De Ostentis* 7.

²⁵⁰1.2.35 (this seems to be an occultation), and 89.

²⁵¹Hesiod 614-617. ²⁵²Geoponica 9.4.1.

²⁵³We find an old tradition preserved in Vergil, *Georgics* 1.217-218 *Candidus auratis aperit cum cornibus annum Taurus*. . . . This quotation is a "reminiscence of a zodiac and religious calendar in which the Bull led the way". See *Encyclopaedia Britannica*¹¹, s. v. *Zodiac*, 28.993, second column, bottom. A poet, however, must not be held to 'strict accountability'. The difference in the constellation that "leads the way" is due of course to the precession of the equinoxes.

APPENDIX CONTAINING ADDITIONAL REFERENCES TO WEATHER AND AGRICULTURAL LORE OF THE STARS

In the following Table the letter C stands for Columella. The numbers after it indicate sections in his *De Re Rustica* 11.2.

Andromeda: C. 59.

Anguifer: C. 49.

Anguis: Vergil, *Georgics* 1.204-207.

Aquarius: Pliny 18.235; C. 4, 14, 52; Isidore, *Origines* 3.71.32; Eratosthenis *Catasterismorum Reliquiae* 26; *Geoponica* 1.1.2, 1.8.8, 1.12.35.

Aquila: Aratus 313-315; Scholia on Aratus 313-314; C. 45, 53, 93, 94, and also 2.10.17; Varro 2.1.18; Pliny 17.131; *Geoponica* 2.403.

Ara: Aratus 408-435; Scholia on Aratus 412, 420; Quintus Smyrnaeus 4.552-555; 13.480-486.

Arctos: *frigens*, Manilius, *Astronomica* 1.314; *frigidus*, Poetae Latini Minores 4. 71, No. 36; *axis frigidus*, Seneca, *Hercules Oetaeus* 1255, Medea 712; *Helice nivosa*, Seneca, *Hercules Oetaeus* 1543; *gelidi triones*, Ovid, *Met.* 2.171; *ventosus*, Statius, *Thebais* 12.653.

Argo: C. 24, 66.

Aries: C. 31, 65; *Geoponica* 1.8.10, 1.12.3.

Aselli: Pliny 18.353.

Bootes: Vergil, *Georgics* 1.229-230.

Callisto: C. 5.

Cancer: C. 4, 51, 97; *Geoponica* 1.10.5, 1.12.18.

Capricorn: Aratus 286-299; Scholium on Aratus 355; Servius on Vergil, *Georgics* 1.336; Scholia *Sangermanensia* in *Germanici Caesaris Aratea*, Breysig's edition, 155 (Teubner, 1867); *Geoponica* 1.8.7, 1.10.11, 1.12.33.

Cassiope: C. 78.

Centaurus: C. 39, 66, 77; Scholium on Aratus 432-433.

Cepheus: C. 51.

Cetos: Scholium on Aratus 355.

Corona (Stephanos): Vergil, *Georgics* 1.219-222; Pliny 18.224; Democritus in *Geoponica* 2.14.4, 3.13.10.

Crater: C. 20.

Dolphin: Pliny 18.235; C. 5, 45, 57, 94.

Equus: C. 24, 31.

Fidicula: see Lyra.

Gemini: Horace, *Carmina* 1.12.27-32; Theocritus 22.1-25. The offices of the twin brethren in protecting sailors are often mentioned: see e. g. Horace, *Carmina* 1.3.2, 3.29.64, 4.8.32; Acts 28.11; *Geoponica* 1.12.12. See also references in Note 67, above.

Hermes: see Mercury.

Leo: Aratus 150-155; Hipparchus 2.1.18; C. 4, 5, 14, 21, 52, 53, 56; Horace, *Carmina* 3.29.19, *Epistulae* 1.10.16; Martial 9.90.12; *Geoponica* 1.12.20.

Lepus: C. 89.

Libra: Vergil, *Georgics* 1.208-211; Pliny 18.221; C. 34, 35.

Lyra (Fides, Fidicula): Ovid, *Fasti* 1.315-316; Pliny 18.289, 294, 314; C. 4, 5, 36, 40, 58, 84, 97; *Geoponica* 1.14.10.

Mercury (Hermes): Theophrastus 46; Pliny 11.37.

Nepa: C. 30, 31, 34, 39, 78.

Ornis (i. e. Cygnus): Aratus 279.

Phatne (Praesepe, Praesepia): Theophrastus 23, 43, 51; Aratus 408-435, 899-998; Theocritus 22.19-22; Pliny 18.353.

Pisces: Isidore, Origines 3.71.32; Vergil, Georgics 4.234; C. 20, 24, 63, 65; Geoponica 1.8.9, 1.12.38.

Plaustrum: Claudian 15.501-502; Eustathius, Migne, Patrologia Graeca 18.720.

Procyon: C. 52.

Protrygeter: Scholium on Aratus 137. See Vinde-miator.

Sagitta: Aratus 300-302; Pliny 17.131.

Sagittarius: C. 20, 93; Geoponica 1.8.6, 1.12.31.

Scorpio: C. 84, 93; Geoponica 1.1.5, 1.12.29.

Taurus: Vergil, Georgics 1.215-218; C. 36, 77, 84, 88; Geoponica 1.8.11, 1.12.7.

Vinde-miator (Protrygeter): Aratus 138, and Scholium ad loc.; Ovid, Fasti 3.407; Pliny 18.310; Vitruvius 9.4.1; C. 24, 58. The very name of this star was derived from its association with farm life.

Virgo: C. 65, 66; Geoponica 1.8.3, 1.10.7, 1.12.23.
UNIVERSITY OF MICHIGAN EUGENE S. MCCARTNEY

REVIEWS

Die Mysterien des Mithra. By Franz Cumont. Deutsche Ausgabe (Von Georg Gehrich), Dritte Auflage, Besorgt von Kurt Latte. Leipzig: B. G. Teubner (1923). Pp. xv + 248.

M. Franz Cumont is well known in this country as the author of two series of lectures, Astrology and Religion, and Immortality and the Life After Death. It may seem late in the day to review now a book which is after all but a revised translation of a work that appeared first in 1899, and which is only a popularized condensation of the author's *magnum opus*¹ of 1899. But the very fact that twenty-four years after its first appearance a new edition was called for, that the book is still authoritative, and that its author is still engaged in adding to, and correcting, its contents shows its importance. More than that, the sober, thoroughly documented, and strictly philological² method of M. Cumont, one of the greatest remaining representatives of the school of religious research inspired by Hermann Usener, forms such an admirable contrast to that of the newest writers on religious history, whose motto seems to be the old Homeric saw (Od. 1.351) of the 'latest song', that it seems not amiss to discuss somewhat more extensively this reproduction by the 'anastatic' process of a book whose last French edition appeared in 1913.

Let me state at the outset that the make-up is pleasing, that the type is free from the uncleanness of the usual anastatic reprint, and that the accompanying plates are well executed. Unfortunately, the same cannot be said of the line drawings in the text. These are clear enough, but far from artistic. The method of reproducing the text made incisive changes impossible. But, as the editor states, the references have

been revised to conform with the latest editions, and the list of monuments has been brought up to date with the kind assistance of M. Cumont himself, in an admirable spirit of true scholarship that knows no national enmities. Especially welcome is the revised map, on which the provenance of all finds is shown in red, thus enabling the user of the book to convince himself at a glance of the peculiar geography of the worship of Mithra.

Mithraism was the greatest and most dangerous enemy of Christianity. At one time, in Renan's opinion, it bade fair to gain the victory over its opponent. Thus the investigation of its origins, its spread, its appeal, and its doctrine is a matter of great importance. In the most painstaking manner, M. Cumont traces the history of the creed. It originated in the remote times of Indo-Iranian unity—inscriptions recently found in Cappadocia show that the god was worshipped in the fourteenth century B. C.—, in the belief in a god of heavenly light, discoverer and defender of truth, and champion of good in the eternal struggle against evil. When Zoroastrianism introduced the dualistic principle into the Persian religion, Mithra suffered for a time a degradation. He became one of the host of subordinate spirits under Ahura-Mazda, a 'Yazata'. But the duty assigned to him in this system, as protector of the just souls against the demons that try to abduct them down to Hell, and as judge at the dangerous bridge over which the souls must pass to Heaven, was destined to become one of the chief supports in the appeal of the later Mithraic religion, for from it the *savior* Mithra developed. Mazdaism seems responsible also for some features whose importance was stressed in the time of full development. For certain ablutions and flagellations are here prescribed in which we may see the germ of the baptism and the bodily trials imposed on the candidates for a degree in the later Mysteries.

The appeal of his original nature was too strong to keep Mithra permanently in a subordinate place. He became the strongest of the 'Yazatas', and, presently, the *mediator* between Ahura and the world of phenomena, a position that he still occupies in Plutarch's³ exposition of the Persian doctrine. At the same time he became the special protector of the Great King. To him the monarch owes the mysterious halo which is the guarantee of his invincibility. Here, doubtless, lies the root of the peculiar favor with which, as M. Cumont shows in a later chapter, the Roman Emperors of the third and fourth centuries viewed a cult that seemed to guarantee their alleged divinity.

When the Greeks first learned of the existence of Mithra, the god had been identified with the Sun-God Shmash, under the influence, it appears, of Chaldaean astrological speculation. When the Persian Empire had fallen before Alexander, the worship of Mithra did not yield to the religion of the conqueror. Although the newcomers equated him with Helios, it is a significant proof of the importance of his religion that his name alone among those of the Persian gods was

¹Textes et Monuments Figurés Relatives au Culte de Mithra, I, II (Brussels, Lamertin, 1896, 1899).

²See Hermann Usener, Philologie und Geschichtswissenschaft, 15 (Bonn, 1882).

³De Iside et Osiride 46.



Greek and Roman Weather Lore of the Sun and the Moon

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Reviewed work(s):

Source: *The Classical Weekly*, Vol. 22, No. 4 (Oct. 22, 1928), pp. 25-31

Published by: [Classical Association of the Atlantic States](#)

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The Classical Weekly

VOLUME XXII, No. 4

MONDAY, OCTOBER 22, 1928

WHOLE No. 588

GREEK AND ROMAN WEATHER LORE OF THE SUN AND THE MOON

Men judge by the complexion of the sky
The state and inclination of the day.

Shakespeare, King Richard the Second 3.2

"There was no information for which Dr. Johnson was less grateful than for that which concerned the weather". I trust that, if classicists hold similar views about the weather in general, they may make an exception of classical weather lore.

In one limited sense it is an anachronism to speak of the popular weather lore of the ancients. In prognosticating they did not make a clear distinction between scientific and popular meteorology. Numerous weather signs that were generally current in Greece and in Italy are recorded in Aristotle's *Meteorologica* and in Seneca's *Naturales Quaestiones*. These scientists did, however, present physical explanations of some signs, but I doubt not that their theories were generally known to educated people who made no pretension to any special scientific knowledge¹.

Any explanation on a physical basis, whether correct or not, belongs to scientific meteorology. This is especially true of theories that have to do with celestial conditions and phenomena. Greek and Roman weather lore of the heavens in general has, therefore, a place in the history of meteorology such as will be impossible for contemporary popular weather signs to attain. In *THE CLASSICAL WEEKLY* 20.43-49, 51-54 I discussed one other aspect of celestial weather lore, the beliefs about the stars and the constellations, under the title, *The Classical Astral Weather Chart for Rustics and Seamen*².

In the eyes of the inhabitants of earth the sun and the moon are the most conspicuous bodies in the heavens. They are not so conspicuous in folklore and religion, although one finds them occupying a more prominent place in the popular imagination the farther back one traces their recorded history. From them a vast body of weather signs has been derived.

I have not the literary artifice to record in brief compass all the different signs, with their minor variations, without giving the article something of the atmosphere of a book of reference. My primary purpose is to make the material available for ready reference.

The translations that I am quoting from the *Phaenomena* of Aratus are by G. R. Mair; those from the *De Signis* of Theophrastus are by Sir Arthur Hort. Both

ancient and modern works that I refer to frequently are given in the notes by the name of the author only, sometimes in abbreviated form, as indicated below³.

The sun and the moon were the calendars of antiquity, especially for the peasant. One of the Greek words for moon is *μήνη*, 'measurer', and the word for month is *μήν*, 'the moon-period'⁴. "... That, in the dim prehistoric time, the Roman month accorded with the period of the moon, seems fairly certain. There are clear indications that the day named *Idus* originally marked the time of the full moon, in the middle of the month, while the first day or *Kalendae* indicated the day of the new moon..."⁵ Appian⁶ makes the statement that it was Julius Caesar who changed the Roman reckoning of the year from the course of the moon to that of the sun.

As Lucretius says⁷, these watchful luminaries, sun and moon, in their course through the revolving world taught men that the seasons return and that the universe is controlled by law and order. At the beginning of his work on Agriculture Varro invokes the sun and the moon by whom the seasons for sowing and reaping are measured. In short, "anyone who desires to forecast the weather must pay special heed to the character of the risings and settings of these luminaries"⁸. Signs derived from the sun were generally regarded as the more dependable⁹.

³Aratus = Aratus, *Phaenomena*, readily accessible in G. R. Mair's translation, in The Loeb Classical Library; Th. = Theophrastus, *De Signis*: a translation of this, by Sir Arthur Hort, is likewise to be found in The Loeb Classical Library; Pliny = Plinius, *Naturalis Historia*; Seneca = Seneca, *Naturales Quaestiones*; Geop. = *Geoponica*, in the Teubner series.

For the following modern works, which are cited more or less freely, only the authors' names are given: Fanny D. Bergen, *Current Superstitions* (Volume 4 of *Memoirs of the American Folk-Lore Society*); H. H. C. Dunwoody, *Weather Proverbs* (United States of America: War Department, Signal Service Notes, No. 9, Washington, 1883); Edward B. Garriott, *Weather Folk-Lore and Local Weather Signs* (United States Department of Agriculture, Weather Bureau, Washington, 1903); Richard Inwards, *Weather Lore: A Collection of Proverbs, Sayings and Rules Concerning the Weather*³ (Elliot Stock, London, 1898); D. E. Marvin, *Curiosities in Proverbs* (G. P. Putnam's Sons, New York and London, 1916); C. Swainson, *A Handbook of Weather Folk-Lore* (Blackwood and Sons, Edinburgh and London, 1873); Daniel L. Thomas and Lucy B. Thomas, *Kentucky Superstitions* (Princeton University Press, Princeton, 1920). An extensive bibliography is given by Inwards, 207-212.

W. J. Humphreys, *Weather Proverbs and Paradoxes* (Baltimore, Williams and Wilkins Company, 1923), discusses the scientific aspects of the proverbs that are reliable—"separates the false from the true". T. Morris Longstreth, *Reading the Weather* (New York, The Macmillan Company, 1923), has much material that is pertinent to this paper.

⁴A scholium on Aratus 733 tells us that the Greeks measured the months by the course of the moon and the Egyptians by that of the sun. For other references to the connection of the sun and the moon with the calendar see, for example, Plutarch, Numa 18.1, Solon 25.3; Diogenes Laertius 1.59. On the moon as measurer see Vergil, *Aeneid* 3.645: *Tertia iam lunae se cornua lumine complent*; Apuleius, *De Mundo* 29; Curtius 8.9.36; *Catalogus Codicum Astrologorum Graecorum* 1.85-87.

⁵Sir John Edwin Sandys, *A Companion to Latin Studies*³, 92. ⁶*De Bellis Civilibus* 2.154. See also Cassius Dio 43.26.1.

⁷5.1436-1439. See also Lucan, *Pharsalia* 10.201: *Sol tempora dividit anni*; Bede, *De Natura Rerum* 19: *Hic <sol> cursu variante dies et menses, tempora dividit et annos*; Pliny 2.12: *<sol> temporum... rector*. ⁸Th. 6.

⁹Aratus 820, whom Vergil follows, *Georgics* 1.439. Plutarch, *Quaestiones De Arati Signis* 1 (Teubner edition, 7, page 102), discusses the reasons for the greater confidence in lunar signs.

¹For a most exhaustive discussion of Greek meteorology see Otto Gilbert, *Die Meteorologischen Theorien des Griechischen Altertums* (Leipzig, Teubner, 1907. Pp. 746).

²I have published in *THE CLASSICAL WEEKLY* the following studies on still other aspects of classical weather lore: *An Animal Weather Bureau*, 14.89-93, 97-100; *The Folk Calendar of Times and Seasons*, 16.3-7; *The Plant Almanac and Weather Bureau*, 17.105-108; *Magic and the Weather in Classical Antiquity*, 18.154-157, 163-166.

THE SUN

SOLSTICES AND EQUINOXES

The solstice was the *magnus anni cardo*¹⁰, the hinge on which the year turned. Its two occurrences were the main divisions of the year, but hardly less important were the periods when days and nights were equal¹¹. For those of us who spend most of our days indoors these four periods pass unnoticed except for a casual comment or two, but they were important events in antiquity. Many agricultural operations were scheduled for these seasons; others were performed before them or after them¹². From the medical point of view the solstices and the equinoxes were dangerous seasons.¹³

At Methymna, the astronomer Matriketas observed the solstices from Mount Lepetymnos¹⁴. Another astronomer, Meton, set up pillars and recorded the turnings of the sun¹⁵. Tradition pretended to know the place on the earth above which the sun reversed its course. 'There is an island called Syria, if you have ever heard of it, above Ortygia, where occur the turnings of the sun'¹⁶.

The ancients believed in the existence of 'solstice rains' (*solstitiales imbres*)¹⁷. Vergil¹⁸ urges farmers to pray for wet summer solstices and clear winters: *Umida solstitia atque hiemes orate serenas, agricolae*.

The equinoctial or 'line' storms are not things of comparatively recent invention. Students of Latin will recall how Caesar hastened his departure from Britain because the equinox was at hand and he did not think that weakened ships should be exposed to the storms of this period¹⁹. He speaks as if the belief in equinoctial storms was to be taken for granted, as indeed it was²⁰. People were reluctant to travel by sea during these periods²¹.

Winds, too, had associations with the solstices and the equinoxes. A representative passage is to be found in Aristotle's *Meteorologica*²²: "Thus Caecias and in general the winds north of the summer solstice blow about the time of the spring equinox, but after the autumn equinox Lips; and Zephyrus about the summer solstice, but about the winter solstice Eurus"²³. When Caesar was keenly desirous of setting out from Brundisium against Pompey, the winds held him back, for it was at the time of the winter solstice²⁴. It was a sign of rain if Lips blew at the equinox²⁵.

"Again, if after the spring equinox mists come down, it is an indication of breezes and winds by the seventh month, reckoning inclusively"²⁶. "The fifteenth day after the winter solstice is generally marked by southerly winds. "If there is a northerly wind, everything dries up, if a southerly, there is abundant moisture"²⁷.

Long range forecasts from solstice to equinox and from equinox to solstice are recorded by Theophrastus (7):

... whatever is the condition of the atmosphere when the Pleiad sets, that it continues in general to be till the winter solstice, and, if it does change, the change only takes place after the solstice: while, if it does not change, it continues the same till the spring equinox: the same principle holds good from that time to the rising of the Pleiad, from that again to the summer solstice, from that again to the autumnal equinox, and from that to the setting of the Pleiad.

A modern popular weather seer professed to be able to "predict weather for six months according to the point from which the wind blew at the equinoxes"²⁸.

The points in the zodiac at which the sun turned in both summer and winter and the signs it entered at the equinoxes were matters of general interest²⁹. We read that there was a subtle influence in certain signs of the zodiac which had some relation to the rains and the storms that occurred at the autumnal equinox and the winter solstice³⁰. Lydus, *De Ostentis* 42, gives a number of weather conditions which he ascribes to the presence of the moon in certain signs at or near the summer solstice. If, for instance, the moon is in Leo as the solstice comes, one may expect thunder and stormy weather.

Scientific weather students proclaim with much ado that the crossing of an imaginary line by the sun in spring and fall does not upset meteorological conditions, and that statistics show that there is not a maximum of storm frequency at either equinox, but rural grandfathers and many other persons are not less obdurate in their belief in the reality of equinoctial storms than would be the ghosts of ancient Romans. It is pertinent to mention in this connection that many outdoor functions have storm associations. Annually I hear that the local county fair always has to contend with rain. A similar tradition is just as fixed for 'Freshman Week' at this University. The reader will recall similar traditions.

The daytime, too, is subdivided into periods, and changes in the weather generally occur at sunrise, mid-morning, noon, mid-afternoon and sunset³¹. For my purposes, however, it seems best to make other captions in studying the relation of the sun to the weather.

SIGNS DERIVED FROM THE RAYS OF THE SUN

When there are rays shooting out before the actual rising of the sun, they are a sign of rain and also of wind³². "The more those beams are borne in shadow,

¹⁰Pliny 18.264. ¹¹See Th. 6-7; Pliny 18.220-222. ¹²For examples see Pliny 13.127; 15.59; 17.127, 130; 18.232, 265, 315; *et passim*. Other interesting references are in Plutarch, *Moralia* 274 C, and in Varro, *Res Rusticae* 1.35.2.

¹³Hippocrates, 'On Airs, Waters and Places', 11. See also Bede's lengthy discussion, *De Aequinoctiis et Solstitiis*, in *De Temporum Ratione*, Chapter 30.

¹⁴Th. 4. ¹⁵Aelian, *Varia Historia* 10.7.

¹⁶Odyssey 15.403-404.

¹⁷Macrobius, *Saturnalia* 5.20.15. Compare Pliny 17.14: per solstitia imbres; 2.108; 18.221.

¹⁸Georgics 1.100-101. Macrobius, *Saturnalia* 5.20.14, says that the sense of these two verses is as follows: Cum ea sit anni temperies ut hiems serena sit, solstitium vero imbricum, fructus optime proveniunt. ¹⁹Caesar, *B. G.* 4.36.2. See also 5.23.5.

²⁰Pliny 2.108, 18.221; Columella 2.4.11, 11.2.31, 11.2.66, 11.2.94; Appian, *Romanae Historiae* 7.6.

²¹Catullus 46.2-3; Cicero, *Ad Atticum* 10.17.3, 12.28.3; Livy 31.47.1, 37.9.5; Tacitus, *Historiae* 5.23, *Annales* 1.70; Vegetius 4.39.2.6, 364 b. See also Pliny 2.119-120, 18.337-338; Seneca, 5.16.3, 5; Aulus Gellius 2.22.7; Apuleius, *De Mundo* 13; Vegetius 4.38.

²²E. W. Webster's translation. ²³Appian, *De Bellis Civilibus* 2.54. ²⁴Th. 20. Compare 35.

²⁶Th. 56. ²⁷Th. 30.

²⁸Journal of American Folk-Lore, 36.16.

²⁹See, for example, Aratus 499-517. ³⁰Pliny 2.108.

³¹Th. 9. ³²Aratus 869-871; Th. 11; Pliny 18.346; Geop. 1.3.2.

the surer sign they give of rain, but if but faint the dusk that veils his beams, like a soft mist of vapour, that veil of dusk portends wind"³³. "But if the rays of the rising or setting sun converge and crowd on one spot"³⁴ . . . those days will run in company with rushing rain"³⁵. Rainy weather is portended when at either the rising or the setting sun the rays appear massed³⁶. When the sun as it rises sends its rays far out among the clouds and its disk presents a hollow appearance³⁷, it signifies rain³⁸. "If at dawn its rays are parted, some pointing to the north and some to the south, while the orb itself is clearly seen between, it is a sign of rain and wind"³⁹. This piece of weather lore was used by Lucan, *Pharsalia* 5.540-543:

Multa quidem prohibent nocturno credere ponto,
nam sol non rutilas deduxit in aequora nubes
concordesque tulit radios: Noton altera Phoebi,
altera pars Borean diducta luce vocabat.

The rays of the rising sun colored as in an eclipse mean rain⁴⁰. If at sunset it rains or if the sun's rays draw a cloud to themselves, there will be a terrible storm the following day⁴¹. According to our own lore, "When you see the sun drawing water at night, know that it will rain on the morrow. The sun is said to be drawing water when its rays can be seen shining through rifts in distant clouds"⁴².

BRIGHTNESS AND COLOR OF THE SUN AND SKY

"May not his orb, whenever thou desirest a fair day, be variegated when first his arrows strike the earth, and may he wear no mark at all but shine stainless altogether"⁴³. A pale sun in the morning means a hail storm⁴⁴. It is a sign of clear weather if in winter the sun has a pale color at the time of setting⁴⁵, or if it becomes red at that time⁴⁶.

When the sun is black⁴⁷ or has black spots⁴⁸ upon it, there will be rain; when it is reddened⁴⁹ or has red spots⁵⁰ upon it, there will be wind; when it is colored both black and red, then there will be rain accompanied by wind⁵¹; but if it rises red and becomes black, it indicates rains⁵². The ancients were interested in the equal or unequal luminosity of the sun⁵³, but do not seem to have known sun spots in our sense of the term. The in-

fluence of these phenomena is not thoroughly understood, but they have been associated with thunderstorms⁵⁴, heat waves, flood, and earthquakes⁵⁵.

If in winter that part of the sky into which the sun goes down is clear, it is a sign of fair weather, unless on the preceding days that part has not been clear, though it was clear above the horizon: in that case the prospect is uncertain. It is also a sign of fair weather, if during stormy conditions that part of the sky into which the sun sets is clear⁵⁶.

The maxim about the clear weather portended by a clear sky at sunset is not to be restricted to winter, however. As Aratus puts it, "If again thus all pure he be in the hour when the oxen are loosed, and set cloudless in the evening with gentle beam, he will still be at the coming dawn attended with fair weather"⁵⁷. Vergil's phrasing is as follows (*Georgics* 1.458-460):

At si, cum referetque diem condetque relatum,
lucidus orbis erit, frustra terreberet nimbis,
et claro silvas cernes Aquilone moveri.

Shakespeare⁵⁸ too has elaborated the idea: "The weary sun hath made a golden set, And, by the bright track of his fiery car, Gives token of a goodly day to-morrow".

An unmistakable sign of rain is the reddish appearance of the sky before sunrise. This usually indicates rain within three days, if not on the same day⁵⁹. A red sky at sunset likewise indicates rain within three days, if not before, but a red sky at dawn is more certain⁶⁰.

The belief in the redness of the sky as a sign of rain seems to belong to almost all ages and to all climes. Christ says in Matthew 16.2: "When it is evening, ye say, It will be fair weather, for the sky is red. And in the morning, It will be foul weather today, for the sky is red and lowering. Ye can discern the face of the sky"⁶¹. Shakespeare, *Venus and Adonis* 453-456, records the same piece of lore:

Like a red morn, that ever yet betoken'd
Wreck to the seaman, tempest to the field,
Sorrow to shepherds, woe unto the birds,
Gusts and foul flaws to herdmen and to herds⁶².

³³A caption in *The Literary Digest* for October 24, 1914 (49. 787) reads: "Sun-Spots and Thunder-Storms". Lydus, *De Oestis* 46, does tell us, however, that the ancients regarded the sun as the cause of thunderbolts.

³⁴A clipping from the Philadelphia Public Ledger of July 22, 1926. In a clipping from the same paper, dated June 1, 1925, a local weather seer makes the following prediction: "The summer will be of five months' duration, not ending until November. The intense heat will be due to spots on the sun".

³⁵The Detroit Free Press of October 17, 1926, quotes a British scientist as seeing some connection between sun spots and the Aurora Borealis.

³⁶Th. 50. Compare Aratus 850-851.

³⁷Aratus 825-827. Compare Pliny 18.342; Isidorus, *De Natura Rerum* 38.5; Geop. 1.2.3. In Aristotle, *Problemata* 26.8, the question is asked, "Why do clear sunsets betoken clear weather and troubled ones stormy?" Compare Shakespeare, *Richard the Second* 2. 4, "Thy sun sets weeping in the lonely west, Witnessing storms to come, woe and unrest".

³⁸Richard the Third 5.3.

³⁹Th. 10; Aratus 866-868.

⁴⁰Th. 10. Bede, *De Natura Rerum* 36, is not in entire agreement: Coelum si vespere rubet, serenum diem, si mane, tempestuosum significat.

⁴¹Compare Isidorus, *De Natura Rerum* 38.5: Item Dominus in evangelio, Si mane rutilat triste caelum, tempestas futura erit.

⁴²Compare the following rime, as listed by Inwards, 62:

Sky red in the morning
Is a sailor's sure warning;
Sky red at night
Is a sailor's delight.

³³Aratus 872-876. See also Pliny 18.344: Cum oriente radii non illustres eminebunt, quamvis circumdatae nubes non sint, pluviam portentent.

³⁴E. Poste, *The Skies and Weather-Forecasts of Aratus*, 40 (London, Macmillan and Co., 1880), translates as follows: "A cone of rays converging towards a point". See also Poste's rather lengthy note on this line.

³⁵Aratus 840-844; Pliny 18.342. In Geop. 1.2.4 it is stated that this sign means clear weather when clouds are crowded about the sun.

³⁶Th. 13; Pliny 18.343. ³⁷On the hollow disk see note 104.

³⁸Pliny 18.346. ³⁹Th. 26. See also Aratus 829-831; Pliny 18. 343; Vergil, *Georgics* 1.445; Varro in Isidorus, *De Natura Rerum* 38.4; Bede, *De Natura Rerum* 36.

⁴⁰Th. 13. See also Aratus 862-865. ⁴¹Pliny 18.343.

⁴²Clifton Johnson, *What They Say in New England: A Book of Signs, Sayings, and Superstitions*, 17 (Boston, Lee and Shepard, 1896).

⁴³Aratus 822-825. See also Th. 50; Pliny 18.342; Vegetius 4.41; Geop. 1.2.2; Bede, *De Natura Rerum* 36.

⁴⁴Pliny 18.342. See also Bede, *De Natura Rerum* 36.

⁴⁵Th. 50. ⁴⁶Si sol rubeat in occasu, sincerus fere dies erit: Isidorus, *De Natura Rerum* 38.5.

⁴⁷Aratus 834-836.

⁴⁸Th. 11, 27; Vegetius 4.41; Claudian, *De Bello Gildonico* 1. 494: Ora licet maculis adperserit occidui sol; Bede, *De Natura Rerum* 36.

⁴⁹Aratus 834-837; Vegetius 4.41. ⁵⁰Th. 27. ⁵¹Aratus 838-839.

⁵²Geop. 1.3.2. ⁵³See, for example, Cassius Dio 45.17.5, 47.40.2.

A version in Scott, *The Pirate*, Chapter 12, is as follows: "What have we got here? A cloudy night and a red morning! That betokens rough weather". The belief assumes proverbial forms. "A red sun has water in his eye"⁶³; "Abendrot Schönwetterbot, Morgen rot fällt in Kot"⁶⁴⁻⁶⁵.

The following is part of a description⁶⁶ of a remarkable dawn of January 13, 1924, which attracted attention on both sides of the English Channel:

The English and French coasts were bathed in lurid crimson amid the hanging folds of fire. The eastern sky was filled with fiery cirrus clouds, shaped like the tentacles of some angry monster, and peering above a low bank of threatening black clouds. Such a crimson dawn foretells rain and blustering wind, often culminating in a fierce tempest. A high dawn, accompanied by red cirrus clouds and a lowering sky, portends tempestuous weather.

The red sky in the morning is one of the comparatively few dependable popular weather signs. A scientific critic informs us that "a red morning sky implies that the whole atmosphere, up to considerable elevations, is humid, and rain, therefore, probable, later in the day"⁶⁷.

A lengthy list of "the most important and reliable forecasts" derived from the appearance of the sun at sunrise and at sunset is given by E. B. Dunn, *The Weather and Practical Methods of Forecasting It* (267-269)⁶⁸.

MIST AND THE SUN

Be on your guard for rain when a thin mist arises before the sun and makes its rays faint⁶⁹; likewise when the sun rises out of clouds⁷⁰. If a cloud appears a little before sunrise, the weather will be clear⁷¹. "... when a broad belt of mist seems to melt and widen before the rising Sun and anon narrows to less, fair will be his course, and fair too, if in the season of winter his hue wax wan at eventide"⁷². Aristotle⁷³ explains that "Mist is what is left over when a cloud condenses into water, and is therefore rather a sign of fine weather than of rain; for mist might be called a barren cloud".

CLOUDS AND THE SUN

The rising sun predicts winds when the clouds become red before it rises; but when black clouds are mingled with the red, it predicts rain too⁷⁴. Clouds massing together before sunrise mean a fierce storm to come; when they are driven from the east and disappearing to the south, they mean clear weather. The less light that is left by clouds enclosing the sun, the fiercer will the storm be; but if there shall be a double circle around it, fiercer still; and again, if this happens at the rising or setting sun and if the clouds

become red, there will come the fiercest storm of all. When clouds do not surround it, but rest upon it, they indicate wind from the quarter from which they came; when they have come from the south, they signify rain too⁷⁵.

"If the sun in winter after gleaming out is again obscured, and this is repeated two or three times, it will be stormy all day"⁷⁶. It is a sign of stormy weather when an obstructing cloud below the sun breaks up its rays as it sinks⁷⁷. The next day will be stormy in proportion to the area of the sun obstructed⁷⁸. Rain will generally come within three days if in winter or spring the sun sets in a cloud⁷⁹.

When clouds that are massed are scattered by Aquilo as the sun approaches them, they portend winds; if they are scattered by Auster, they portend rains. Clouds girding the heavens on either side of the setting sun signify tempest. Heavy clouds from the east are a more serious threat of rain for the following night, from the west, for the following day⁸⁰.

"But if without a cloud he <the sun> dip in the western ocean, and as he is sinking, or still when he is gone, the clouds stand near him blushing red⁸¹, neither on the morrow nor in the night needst thou be fearful of rain"⁸². After a rain bronze-colored clouds near sunset generally herald fine weather for the next day⁸³. The scattering of red clouds at sunset means dry weather⁸⁴. If the sun sinks pales into dark clouds, Aquilo will blow⁸⁵.

HALOS AND THE SUN

The ring or circle around the sun or moon was called by the Greeks *άλως*, 'threshing floor', by the Romans, *corona*, 'crown'⁸⁶.

"A dark halo round the sun indicates rain, especially if it occurs in the afternoon"⁸⁷. If the rising sun is surrounded by a halo, wind may be looked for from the section in which the halo breaks, but, if the entire halo dissolves evenly, clear weather is indicated⁸⁸. If at sunset there is a white circle, it means a mild storm during the night; if a mist, a fiercer storm; if the sun is bright, wind; but if the circle is dark, there will be a strong wind from the direction in which the circle breaks⁸⁹. When halos are nearer to the sun than usual and are uniformly dark, they betoken fiercer storms; if there are two rings, they herald tempests fiercer still⁹⁰.

⁶³Pliny 18.344-345.

⁶⁴Th. 46. Compare Th. 22, where a more general statement is made. See also Theophrastus, *Historia Plantarum* 8.10.3.

⁶⁵Th. 11; Aratus 851-857. Pliny, 18.346, says there will be rain if there is a cloud around the sun; Geop., 1.3.2, says this will occur if there is a black cloud near by at the left.

⁶⁶Th. 38.

⁶⁷Th. 11. Compare Pliny 18.225: Ita nubilō occasu pluviosam hiemem denuntiat; Aratus 842-843.

⁶⁸Pliny 18.355.

⁶⁹Compare Scott, *The Pirate*, Chapter 8: "The sibyl meantime... let in the fitful radiance of the sun, now lying almost level upon a great mass of red clouds, which, boding future tempest, occupied the edge of the horizon, and seemed to brood over the billows of the boundless seas".

⁷⁰Aratus 858-861; Geop. 1.2.4. ⁷¹Th. 51.

⁷²Geop. 1.2.5. Compare 1.2.2.

⁷³Isidorus, *De Natura Rerum* 38.5; Bede, *De Natura Rerum* 36. ⁷⁴For the difference between 'halo' and 'corona' in English see Humphreys, 36-37, and Longstreth, 140-141.

⁷⁵Th. 22. ⁷⁶Pliny 18.345. ⁷⁷Pliny 18.346.

⁷⁸Aratus 877-879. See also Pliny 18.344.

⁶³Inwards, 55. ⁶⁴Deutsche Rundschau 198.46.

⁶⁵For many other proverbs about the redness of the sky see Marvin, 205; Inwards, 61-62; Swainson, 177-182.

⁶⁶The Illustrated London News, January 26, 1924 (164.135). A drawing of the sunrise, by Scriven Bolton, an astronomer-artist, is reproduced on this page.

⁶⁷Humphreys, 31.

⁶⁸Second edition (New York, Dodd, Mead and Company. No date is given, but the book was published circa 1917).

⁶⁹Aratus 845-847. ⁷⁰Th. 11; Aratus 842-843. ⁷¹Geop. 1.2.2.

⁷²Aratus 847-850. ⁷³Meteorologica 1.9, 346 b (E. W. Webster's translation). ⁷⁴Pliny 18.342.

Aristotle, *Meteorologica* 3.3, 372 b, gives the scientific explanation of the weather significance of the halo:

Hence in itself it is a sign of rain, but if it fades away, of fine weather, if it is broken up, of wind. For if it does not fade away and is not broken up but is allowed to attain its normal state, it is naturally a sign of rain since it shows that a process of condensation is proceeding which must, when it is carried to an end, result in rain. For the same reason these haloes are the darkest. It is a sign of wind when it is broken up because its breaking up is due to wind which exists there but has not reached us. This view finds support in the fact that the wind blows from the quarter in which the main division appears in the halo. Its fading away is a sign of fine weather because if the air is not yet in a state to get better of the heat it contains and proceed to condense into water, this shows that the moist vapour has not yet separated from the dry and firelike exhalation: and this is the cause of fine weather⁹¹.

In his *Naturales Quaestiones* 1.2, Seneca, after repeating many of these weather signs derived from halos and adding to them, gives scientific explanations much in the manner of Aristotle⁹².

With regard to the dependability of halos as weather signs, Humphreys writes as follows (38):

Halos are very commonly seen in that high veil of cirrus clouds that so frequently is caught up from the tops of storms and carried far ahead by the swiftly moving currents that nearly always prevail at great altitudes. It is this usual forward position of halos relative to moving storms that makes them the fairly good indicators they are of approaching bad weather. As the proverb puts it,

"The moon with a circle brings water in her beak".

And, as the Zuni Indians say,

"When the sun is in his house it will rain soon"⁹³.

SUN DOGS

A picturesque appearance in the sky is the reflection of the sun called by the Greeks *παρήλιον*, by the Romans *imago solis*, by us *parhelion*, *sun dog*, *sun's hound*, and *mock-sun*⁹⁴. No matter in what part of the heavens it appeared, to the Greeks it signified rain or wind⁹⁵. Aratus⁹⁶ is very explicit: "Mark as the Sun is rising or setting, whether the clouds, called *parhelia*, blush (on South or North or both), nor make the observation in careless mood. For when on both sides at once these clouds gird the Sun, low down upon the horizon, there is no lingering of the storm that comes from Zeus. But if only one shine purple to the North, from the North will it bring the blast; if in the South, from the South; or down pour the pattering rain-drops". According to Theophrastus (22), "If two mock-suns appear, one to the south, the other to the north, and there is at the same time a halo, these indicate that it will shortly rain".

There are many passages both in Greek and in Latin authors calling attention to the appearance of

two, three, or even more *parhelia* at the same time⁹⁷. "They have scarcely ever appeared when the sun was on the meridian, though this once happened in Bosphorus where two mock suns rose with the sun and followed it all through the day till sunset"⁹⁸.

Ancient scientific explanations of the nature of *parhelia* are to be found in Aristotle, *Meteorologica* 3.3, 372 b, Seneca, 1.11, and Psellus, *De Omnifaria Doctrina* 109 (Migne, *Patrologia Graeca* 122, col. 752)⁹⁹.

In our own lore sun dogs are said to be a sign of coming rain. At Scilly Cove, Newfoundland, "Sun's 'hounds'... before the sun denote dirty weather; after the sun, denote fine weather"¹⁰⁰. The New York Times for December 24, 1925, notes that three were seen the day before in Boston¹⁰¹. Compare Shakespeare, *III Henry the Sixth* 2.1: "Three glorious suns, each one a perfect sun; Not separated with the racking clouds, But sever'd in a pale clear-shining sky".

WINDS AND THE SUN

In addition to the weather lore of the winds introduced sporadically in other parts of this paper the following miscellaneous items may be listed:

Winds get up at sunrise or moonrise. If the rising sun or moon have caused the wind to cease, presently it gets up again with more force, and winds which begin to blow in the day-time last longer and are stronger than those which begin at night¹⁰².

Again, if it <the sun> sets or rises with a burning heat, and there is no wind, it is a sign of wind or rain¹⁰³.

If the sun rises with a burning heat but does not shine brilliantly, it is a sign of wind. If the sun has a hollow appearance¹⁰⁴, it is a sign of wind or rain. If it blazes with a burning heat for several days, it portends long-continued drought or wind¹⁰⁵.

If the sky is overcast in whatever quarter the sun is first seen, there will be wind from that quarter¹⁰⁶.

There was a general belief that winds died down at sunset¹⁰⁷. In this connection it is worth while to recall Vergil, *Aeneid* 3.568: *Interea fessos ventus cum sole reliquit*. In commenting on this line Servius says that a change of wind must occur at either the rising or the setting sun.

ASTROLOGY AND THE SUN

Aristotle¹⁰⁸, after stating that both the rising and the setting of Orion are considered to be treacherous and

⁹¹E. W. Webster's translation.

⁹²For modern lore of solar halos see Inwards, 63-64.

⁹³See also Humphreys, 39-40; Longstreth, 140-143.

⁹⁴"At each point of contact <of the arches of halos> occurs a *parhelion* which is a mock sun of brilliant colors called a sun-dog. Since the sun-dog is brighter than the other parts of the halo it sometimes appears when the rest of the halo cannot be seen". (Longstreth, 140-141).

⁹⁵Th. 29. ⁹⁶880-889. See also Seneca, 1.13.1 and 3.

⁹⁷Livy 28.11.3, 29.14.3; Julius Obsequens, Nos. 32 (92), 68 (128), 70 (130); Pliny 2.99; Gregory of Tours, *Historia Francorum* 4.30 (Migne, *Patrologia Latina* 71.294); Lydus, *De Ostentis* 4. See also A. S. Pease, M. Tulli Ciceronis *De Divinatione*, page 269 (University of Illinois Studies in Language and Literature, VI and VIII).

⁹⁸Aristotle, *Meteorologica* 3.2, 372 a (E. W. Webster's translation).

⁹⁹See too Stobaeus, *Eclogae* (Wachsmuth-Hense edition), 1, page 241.

¹⁰⁰Bergen, 110. See also Inwards, 63.

¹⁰¹Longstreth says (141): "Sun-dogs hunt in pairs or fours".

¹⁰²Th. 33. See also Pliny 2.129. ¹⁰³Th. 11.

¹⁰⁴Compare Aratus 828 and Pliny 18.342 for the hollow disk. Plutarch, *Quaestiones De Arati Signis* 2 (Teubner edition, 7, pages 102-104), attributes the appearance of the hollow sun to clouds and the density of the air. See also a passage in Lucan 5.544-545:

(Sol) Orbe quoque exhaustus medio languensque recessit spectantis oculos infirmo lumine passus.

¹⁰⁵Th. 26. ¹⁰⁶Th. 31. ¹⁰⁷Theophrastus, *De Ventis* 3.15-16.

¹⁰⁸*Meteorologica* 2.5, 361 b.

stormy, adds that a state of change is always indefinite and therefore liable to disturbance. The truth supposed to lie in this generalization forms the basis of astrological weather lore. We are told that it often happens that the planets as they enter or leave the signs of the zodiac cause a cessation of clear weather¹⁰⁹. Good examples are to be found in Aratus:

Then the fields are seen bereft of corn-ears, when first the Sun comes together with the Lion. Then the roaring Etesian winds fall swooping on the vasty deep, and voyaging is no longer seasonable for oars. Then let broad-beamed ships be my choice, and let steersmen hold the helm into the wind¹¹⁰.

Grievous then is the crashing swoop of the South winds when the sun joins Aegoceros, and then is the frost from heaven hard on the benumbed sailor¹¹¹.

Lydus says that when the sun is in Pisces the downfall of rain will be not less than a deluge¹¹². He tells us likewise that, if in the month of April when the sun is entering Aries it should happen to thunder without rain ensuing, there will be, among other calamities, suffocating heat and drought and unproductive crops¹¹³. If thunder should happen to occur when the sun is entering Aegoceros in January, there will be a thick and smoky fog, so that fruit will decay and the wine will be of inferior quality¹¹⁴.

Various kinds of weather are caused likewise if there is an earthquake when the sun is in certain 'houses'¹¹⁵.

Since so much interest was manifested in weather signs, Vergil was sure of interested readers for his poetic elaboration of presages derived from the sun:

Also the sun both with his rising beams
And when in western wave his front he hides,
Gives many a token. Signs infallible
Attend the sun. He shows them in the skies
At morn and when the rising stars appear¹¹⁶.
When his dim dawn a spotted mantle wears
And he, cloud-wrapt, the half his orb withdraws,
Then look for showers¹¹⁷: for then the southern storm,
Of forest, flock, and field the wrathful foe,
Is speeding from the deep. Or when at dawn
Sparse beams pierce heavy clouds, and pale of brow
Aurora from Tithonus' saffron bed
Shall take her flight¹¹⁸,—ah, then the tendrilled vine
For mellowing grapes will sorry shelter prove,
While rattling thick upon the roof down pours
The dancing hail. But also when the sun
Is setting and his heavenly course is spanned,
Then more than ever mark his aspect well.
For oft we see strange shifts of color stray
Along his face: the azure heralds rain,
Flame-hued, strong wind. But if red flashes glow
With mingling spots, then you will soon behold
A heaven-wide tumult of dark clouds and storms.
On such a night let none my ship compel
On the deep seas to ride, nor from safe shore
Her cable sever. But if his orb shall shine
Undimmed, both when he gives the glorious day
Or his own gift beneath the world conceals,
Then vain your fear of storms, and you shall see
Your waving woods by cloudless north-winds move.
Lastly, what morn the closing eve portends,
What winds bring rainless clouds, what coming harm

The misty southwind means, of these and more
The sun will show the signs¹¹⁹.

More or less extensive modern collections of solar weather signs may be found in Dunwoody, 76-79; Garriott, 25-27; Inwards, 55-64; Thomas, Nos. 2456, 2457, 2463, 2464, 2469, 2471, 2473, 2479-2486; and Swainson, 175-182. Bacon, *Historia Ventorum*, repeats many Greek maxims about the sun.

It is obvious, of course, that not a great deal of the popular weather lore of the sun is dependable. The scientific basis of those adages that are trustworthy is given by William J. Humphreys in his delightful little book, *Weather Proverbs and Paradoxes* (see especially pages 11-32). Another interesting discussion of signs in general is that by Professor Robert DeC. Ward, *Weather Proverbs, Good and Bad*, which appeared in the *Harvard Alumni Bulletin*, 27.613-621. The more reliable weather signs of the sun are collected in Edward Vernon's *Is It Going to Rain?*¹²⁰

Professor Garriott thus concludes his discussion (published in 1903) of attempts to connect the weather upon earth with sun spots (33-34):

It appears, in fact, that while a consensus of opinion of those who have contributed to sun-spot literature is, that solar disturbances, as indicated by sun spots, affect the earth's magnetic and electrical conditions, a definite relation between sun spots and meteorological conditions has not been established. It is, however, possible and even probable, that longer periods of observation will permit comparisons that may define concurrent cycles in sun spots and weather. The idea that the sun controls not only the character of the weather experienced in the several seasons, but also the ordinary and extraordinary weather changes to which we are subjected from day to day, is a popular one, and discoveries in this direction will be welcomed by the meteorologist and the layman.

A more recent writer¹²¹, however, concludes that so far as evidence is yet at hand, it suggests that the degree of storminess upon the earth varies in fairly close harmony with disturbances of the sun's atmosphere as indicated by sunspots.

In *The London Illustrated News*¹²² for November 27, 1926, there is a page of illustrations of sun spots under the caption: *The Cause of Recent Hurricanes? Sun-Spots Coincident with Them*. It shows pictures of sun spots on the day of the Florida hurricane, September 17, 1926, as well as on the days preceding and following.

I am assured by an astronomer, however, that "there is no known connection between any given sun spot and any given storm on the earth's surface".

Efforts are now being made to show that there is a close connection between the sun and our weather. I find the following popular summary¹²³ of the work of an American meteorologist along this line:

Mr. H. H. Clayton... has proved that very distinct changes of barometer, temperature, and rainfall are

¹⁰⁹Vegetius 4.40.

¹¹⁰Aratus 150-155. ¹¹¹Aratus 291-294. ¹¹²De Ostentis 58.

¹¹³De Ostentis 24.

¹¹⁴De Ostentis 23. For somewhat similar data see Columella 11.2.49, 52, 58, 94.

¹¹⁵Lydus, De Ostentis 56, 57, 58.

¹¹⁶See also Aratus 819-821. ¹¹⁷Isidorus, De Natura Rerum 38.4, refers to Vergil.

¹¹⁸Compare Aratus 845-846.

¹¹⁹Georgics 1.438-463 (T. C. Williams' translation: Harvard University Press, 1915). For other groups of signs derived from the sun see Aratus 819-889; Pliny 18.342-346. The signs in Theophrastus, De Signis, are not grouped.

¹²⁰Second edition, Edinburgh, Macniven and Wallace, no date.

¹²¹Ellsworth Huntington, *Earth and Sun: An Hypothesis of Weather and Sunspots*, 35 (Yale University Press, New Haven, 1923).

¹²²169.1037.

¹²³Pages 111-112 of an article by C. G. Abbot, *Measuring the Sun's Heat and Forecasting the Weather*, The National Geographic Magazine, 49. 111-126.

caused by these changes of the intensity of sun rays. He even goes so far as to say . . . that all that we call weather—symbol for all that is variable, in distinction to climate, which is the steady, average condition of things—is really due to the sun's variation¹²⁴.

The following titles of papers give an indication of the trend of contemporary investigation of the effects of the sun upon the weather: Solar Variation and Forecasting¹²⁵; Solar Radiation and Weather, or Forecasting Weather from Observations of the Sun¹²⁶.

(To be concluded)

UNIVERSITY OF MICHIGAN

EUGENE S. MCCARTNEY

REVIEWS

The Healing Gods of Ancient Civilization. By Walter Addison Jayne, M.D. New Haven: Yale University Press (1925). Pp. XXXIX + 569. \$5.

The publication of Dr. Jayne's work, *The Healing Gods of Ancient Civilization*, was made possible by the Philip Hamilton McMillan Memorial Publication Fund. To its generosity, no doubt, we owe the almost sumptuous appearance of the large, open print, and the seven beautiful plates of illustrations, all of which, with the exception of the "Abaton of Kos" (399), are from authentic monuments. In place of the latter plate, which appears to the reviewer both fanciful and theatrical, one would have preferred to see a reconstruction of the Epidaurian sanctuary.

The scope of the book is best understood from a conspectus of its contents: Introduction (XXV-XXXV); I. Egyptian Gods (3-86); II. Babylonia and Assyria (89-128); III. Pagan Semites of the West (131-142); IV. Indian Gods (145-178); V. Iranian Gods (181-197); VI. Grecian Gods (201-369); VII. Roman Gods (373-499); VIII. The Ancient Celts (503-521); Bibliography (523-542); Index (543-569).

The author excuses himself (XII) for having excluded the Post-Vedic religion, Buddhism, the Slavs and Teutons, as well as Ancient America, because "they would well repay a more detailed study than has yet been given them". He has also excluded the ancient Hebrews, presumably because he does not consider it his province to penetrate beyond the monotheism of the Bible, although Wellhausen and other scholars have done much to lift the veil covering the pre-revelation stage of the southern Semites.

The reason given by Dr. Jayne for these omissions leads us at once to note the chief characteristic of the book. Of course nobody will expect a physician, or for that matter, any scholar, to possess the equipment needed to encompass the enormous field of knowledge covered in this book. Dr. Jayne's work, however, is based entirely on secondary information and is, in fact, only a very industrious compilation of such information as was available to the author. The bibli-

ography, indeed, shows very wide reading, not only in English, but also in French and German; in the latter the author had apparently to rely on the assistance of Mrs. Martin L. Cook. He has also taken the precaution to submit parts of the manuscripts to such authorities as the late Morris Jastrow, Jr., and Professors Henry F. Lutz and T. George Allen, and he has had the advice and assistance of others. But the fact remains that the author is himself not an investigator, but a physician interested in the religious roots of his science and that he is satisfied, in general, with presenting the material without any criticism.

Because the book is evidently addressed to a wide circle of readers, each chapter is divided into two parts, the first of which has little connection with the real topic of the author. It contains a general survey of the religion of the people under discussion. Thus the chapter on Egypt contains paragraphs on the pyramid texts, local deities, the Book of the Dead, festivals, as well as a survey of the medical libraries and of the medical papyri and their methods. The first parts of the chapters on Greece and Rome, too, deal, among other topics, with the origin of the gods, absence of dogma and moral restraint in religion, chthonic deities, animal incarnations, foreign influences in Roman religion, augury, haruspices, Orientalism, and the downfall of paganism. In each instance only the latter part of this first division treats of the views of illness and medicine as far as religious belief and practice enter into them. These 'introductory divisions', as we may call them, are naturally the least satisfactory. Lack of space permitted only the most condensed treatment, and little is found in them that is not in Hastings' *Encyclopaedia of Religion and Ethics*, to which the writer appears most deeply indebted, and in the generally accessible handbooks on the religions of the different nations discussed. There are, of course, statements with which the specialist will take issue. Thus, we read in the Preface (X) that the Mediterranean civilizations had their development in an Oriental nursery, but that "finally they overflowed westward. The learning came to Greece". This may be said to be based on the view formulated by Otto Gruppe in his *Griechische Mythologie und Religionsgeschichte* (in Iwan Mueller's *Handbuch der Altertumswissenschaft*). But that view never found many adherents. It is scarcely maintainable, even if one does not go the whole way with Carl Schuchhardt's *Alt-Europa* (1919), which derives the Mediterranean civilization from two or three separate migrations from Spain and from the Rhine valley. Granting all possible strength to the Oriental influence on the Minoan-Mycenaean civilization, it still remains true that there is a large original and native stratum which is independent of the East. A lack of philological and historical training is also evident in the statement (31) that King Athotis, of the first dynasty of the Thinite period, wrote anatomical works, for this bit of information is quoted from the works of Sextus Iulius Africanus, who ascribes it to Manetho. Africanus, however, a writer of the third century of our era, was a critic of biblical tradition, but one of the

¹²⁴See also chapter 10 (215-269), *The Sun and the Weather*, in *World Weather* (The Macmillan Co., 1923), by H. H. Clayton.

¹²⁵By C. G. Abbot, *Smithsonian Miscellaneous Collections*, Vol. 77, No. 5.

¹²⁶H. H. Clayton, Vol. 77, No. 6.



Greek and Roman Weather Lore of the Sun and the Moon (Concluded)

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Reviewed work(s):

Source: *The Classical Weekly*, Vol. 22, No. 5 (Oct. 29, 1928), pp. 33-37

Published by: [Classical Association of the Atlantic States](#)

Stable URL: <http://www.jstor.org/stable/4389206>

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The Classical Weekly

VOLUME XXII, No. 5

MONDAY, OCTOBER 29, 1928

WHOLE No. 589

GREEK AND ROMAN WEATHER LORE OF THE SUN AND THE MOON

(Concluded from page 31)

THE MOON

'Twas Jove's own grace that by sure signs
Men prophesy of droughts, rains, frost and winds,
Watching the admonitions of the moon,
Marking what bodes a gale, what oft-seen signs
Bid herdsmen keep their cattle nigh the barn¹²⁷.

With these lines Vergil introduces his long list of weather signs. Vegetius¹²⁸ describes the effect of the moon upon the weather very succinctly when he states that it reveals as in a mirror the changes from clear to stormy and from stormy to clear. We are told that changes in the weather occurred at the main divisions of the night¹²⁹, but moonrise is the time that is mentioned most frequently.

Much stress is laid also upon the effect of various periods within the month¹³⁰. Theophrastus explains (5) that "the meetings of the months are stormy, because the moon's light fails from the fourth day from the end of one month to the fourth day from the beginning of the next". The days of the interlunary period were especially feared by sailors and even the ignorant knew of their special terrors¹³¹.

The full moon and the eighth and the fourth days make divisions into halves, so that one should make the new moon the starting-point of one's survey. A change most often takes place on the fourth day, or, failing that, on the eighth, or failing that, at the full moon; after that the periods are from the full moon to the eighth day from the end of the month, from that to the fourth day from the end, and from that to the new moon¹³².

Aratus says (781-782) that the horns of the crescent moon foretell the character of the coming month, but later on (806-807) he restricts this statement to the period of the half-moon. Theophrastus asserts (12) that whatever signs the crescent moon gives she gives when she is three days old. Vergil¹³³ prefers the fourth day. At this time the Egyptians too paid most attention to the moon¹³⁴. If the moon shall not have appeared before the fourth day and if Favonius is blowing, the entire month will be stormy. On the fourth day the moon determines the character of the winds for the next month¹³⁵. If on the sixteenth day the moon appears extremely fiery, it forebodes fierce storms¹³⁶.

Aratus likewise urges men (799-801) to "scan her when full and when half-formed on either side of full, as she waxes from or wanes again to crescent form, and

from her hue forecast each month". Theophrastus informs us (12) that the indications are less certain when the moon is not full.

Similar ideas are still current¹³⁷. In Longfellow's *The Golden Legend*¹³⁸ the Padrone exclaims:

"I must entreat you, friends, below!
The angry storm begins to blow,
For the weather changes with the moon."

The notion that the weather changes with the moon's quarterings is still held with great vigour in England <and elsewhere!>... That educated people to whom exact weather records are accessible should still find satisfaction in the fanciful lunar rule, is an interesting case of intellectual survival¹³⁹.

The absence of all connection between the moon's phases and the weather is cleverly stated in the following verses¹⁴⁰:

The moon and the weather
May change together;
But change of the moon
Does not change the weather.
If we'd no moon at all,
And that may seem strange,
We still should have weather
That's subject to change.

THE CRESCENT MOON

The lore of the crescent moon is elaborate. Aratus gives a lengthy list of signs (778-795):

Scan first the horns on either side the Moon. For with varying hue from time to time the evening paints her and of different shape are her horns at different times as the Moon is waxing—one form on the third day and another on the fourth. From them thou canst learn touching the month that is begun. If she is slender¹⁴¹ and clear about the third day, she heralds calm: if slender and very ruddy, wind; but if thick and with blunted horns she show but a feeble light on the third and fourth night, her beams are blunted by the South wind or imminent rain¹⁴². If on the third night¹⁴³ neither horn nod forward or lean backward, if vertical they curve their tips on either side, winds from the West will follow that night. But if still with vertical crescent she bring the fourth day too, she gives warning of gathering storm¹⁴⁴. If her upper horn nod forward, expect thou the North wind, but if it lean backward, the South¹⁴⁵.

Theophrastus adds a few variations (27):

¹³⁷For examples see Swainson, 184-185, 191-192; Inwards, 71-72.
¹³⁸Near the end of Part V.

¹³⁹Edward B. Tylor, *Primitive Culture*⁶, 1.130 (John Murray, London, 1920). See also Longstreth, 178-179.

¹⁴⁰This rhyme, by an unnamed weather-observer, is quoted in *Notes and Queries*, September 23, 1882 (page 246).

¹⁴¹Lucan 5.548 says of the moon: *Nec duxit recto tenuata cacumina cornu*.

¹⁴²See also Pliny 18.347, 349; Geop. 1.3.1.

¹⁴³Compare Lucan 1.217-218: "...auxerat undas tertia iam gravido pluvialis Cynthia cornu..."; Valerius Flaccus 2.56: *gravido surrexit Cynthia cornu*.

¹⁴⁴Compare Pliny 18.348: *Si quarto die luna erit directa, magnam tempestatem in mari praesagiet...*

¹⁴⁵Aratus is quoted by Isidorus, *De Natura Rerum* 38.3.

¹²⁷Georgics 1.351-355 (T. C. Williams's translation).

¹²⁸De Re Militari 4.41. ¹²⁹Th. 9.

¹³⁰See Scholium on Aratus 733. ¹³¹Vegetius 4.40.

¹³²Th. 8. Compare Aratus 805-810; Pliny 18.350.

¹³³Georgics 1.432. ¹³⁴Pliny 18.347. ¹³⁵Pliny 2.128.

¹³⁶Pliny 18.349.

Again, if while a north wind blows, the horns of the crescent moon stand out straight, westerly winds will generally succeed, and the rest of the month will be stormy. When the upper horn of the crescent moon is bent, northerly winds will prevail for that part of the month: when the lower horn is bent, southerly winds will prevail. If however the horns up to the fourth day point straight and have not a graceful bend inwards but round to a circle, it will generally be stormy till the middle of the month¹⁴⁶.

When the moon rises with the upper horn darkened, there will be rain as it wanes, with the lower one darkened, rain before the full moon, with its middle darkened¹⁴⁷, rain at full moon. From another source we learn that, if the tip of the crescent moon has black spots on it at the first of the month, there will be rains, and that, if the spots are in the middle, there will be clear weather when the horns are full¹⁴⁸.

Those mists which come down when the moon is in its first quarter indicate breezes for that period, those which come down when the moon is in its third quarter indicate rain. And the more mists come down when the moon is assuming either shape, the more certainly is the result just mentioned indicated¹⁴⁹.

In English there is considerable weather lore of the moon that survives from antiquity, but I believe that our own lore expresses it more picturesquely.

Every one knows that when a line joining the horns or points of the moon's crescent lies nearly perpendicular to the horizon so that the crescent cannot hold water¹⁵⁰, the moon is popularly called a *wet moon*, and that when it is almost horizontal, so that the crescent can apparently hold water, the moon is termed a *dry moon*, and is commonly considered a sign of fair weather¹⁵¹.

There are many other ways of indicating the positions of the crescent moon. When its horns are turned upwards, it is said to be lying on its back¹⁵². The Indians said that, when the moon lay sufficiently on its side to allow a powder horn to be hung on its tip, the weather during that moon would be dry¹⁵³. Under such circumstances English fishermen say you may hang your hat upon it¹⁵⁴. In Adam Bede (Chapter 18) George Eliot puts the following words into the mouth of old Martin:

It 'ud ha' been better luck if they'd ha' buried him i' the forenoon when the rain was fallin'¹⁵⁵; there's no likelihoods of a drop now, an' the moon lies like a boat there, dost see? That's a sure sign o' fair weather; there's a many as is false, but that's sure.

In Thomas Dekker's *Match Me in London*, Act 1, the king says:

My Lord, doe you see this change i'th the Moone?
Sharp hornes
Doe threaten windy weather, . . .

¹⁴⁶See also Th. 38.

¹⁴⁷Pliny 18.349. See also Servius on Vergil, *Georgics* 1.428; Lucan 5.547.

¹⁴⁸Nigidius as quoted by Isidorus, *De Natura Rerum* 38.2. See also Bede, *De Natura Rerum* 36.

¹⁴⁹Th. 56.

¹⁵⁰"If the moon of the first quarter is tipped so that water would pour out of the curve, it means a rainy month": so *Journal of American Folk-Lore* 36.8. See also Bergen, 110.

¹⁵¹J. R. Kippax, *The Call of the Stars*, 338.

¹⁵²A common expression. See, for instance, Thomas, No. 2574. Bergen, 110. See also Thomas, No. 2575; *Journal of American Folk-Lore* 36.16.

¹⁵³T. F. Thielton Dyer, *English Folk-Lore*, 40 (London, 1880).

¹⁵⁴"Happy are the dead that the rain rains on" is an old superstition.

This sign has reason behind it. When the moon's horns appear sharp, there are no temperature inequalities in the atmosphere, "and the natural inference is that there are strong overhead winds which later may reach the surface of the earth"¹⁵⁶.

The condition indicated by Theophrastus (27) in describing the horns rounding to a circle has long been vividly described in English as "the old moon in the new moon's arms"¹⁵⁷. An instance may be found in an old ballad called *Sir Patrick Spens*¹⁵⁸:

"I saw the new moon late yestreen,
Wi' the auld moon in her arm;
And if we gang to sea, master,
I fear we'll come to harm"¹⁵⁹.

BRIGHTNESS AND COLORS OF MOON

The varying hues of the moon, as well as its varying shapes, afford indications of the weather¹⁶⁰. The moon rising bright and clear signifies clear weather¹⁶¹. This statement is sometimes made specifically of the half-moon¹⁶² and the full moon¹⁶³. "Again, it indicates fair weather if the outline of the moon on the third day is bright"¹⁶⁴.

When the moon is dusky¹⁶⁵ or has black spots¹⁶⁶, it means rain; when it is reddened¹⁶⁷ or has red spots¹⁶⁸, it means wind. *Nempe irae signum est rubor oris*¹⁶⁹. Should the moon be colored a mixture of dark and red, clouds and raging squalls will follow¹⁷⁰.

HALOS AND THE MOON

"A halo about the moon signifies wind more certainly than a halo about the sun: but in either case, if there is a break in the halo, it indicates wind, which will come from the quarter in which the break is"¹⁷¹. Varro declares that, if the full moon has a circle about it, wind is to be looked for in the quarter in which it shines the brightest¹⁷².

The even formation and disappearance of a halo signify fair weather¹⁷³. On the third day a complete halo blushing red foretells storm, and the ruddier the

¹⁵⁶Humphreys, 42.

¹⁵⁷"When the moon shows a very thin crescent, the dark portion of the lunar globe can be dimly seen standing out against the sky, shining with a faint soft light, called the ashen light—la lumière cendrée". So J. R. Kippax, *The Call of the Stars*, 337. This aspect of the moon is illustrated in Plate 27.

¹⁵⁸*The Ballad Book* (edited by William Allingham), 62 (Macmillan and Co., London, 1898).

¹⁵⁹For other lore of the crescent moon see Inwards, 70-71.

¹⁶⁰Aratus 779-781.

¹⁶¹Th. 50; Pliny 18.347. Compare Aratus 802, and Vergil, *Georgics* 1.396: nec fratris radii obnoxia surgere Luna <videtur>

¹⁶²Geop. 1.2.1.

¹⁶³Th. 50; Geop. 1.2.1. Varro, cited by Pliny 18.348, says that calm days are signified if the full moon is clear in the middle; if the full moon is ruddy, winds are signified. See also Seneca, *Phaedra* 751-755.

¹⁶⁴Th. 51. Compare Aratus 783; Geop. 1.2.1.

¹⁶⁵Th. 12, 27; Pliny 18.347; Vegetius 4.41; Geop. 1.2.1, 1.3.1.

¹⁶⁶Th. 27; Aratus 804.

¹⁶⁷Th. 12, 27; Aratus 803; Pliny 18.347-348; Quintilian 5.9.15-16; Lucan 5.549; Isidorus, *De Natura Rerum* 38.2; Vegetius 4.41; Geop. 1.2.1, 1.3.1; Bede, *De Natura Rerum* 36: Luna quarta si rubeat quasi aurum, ventos ostendit.

¹⁶⁸Th. 27.

¹⁶⁹Claudian 8.426-428: quo saucia vento decolor iratos attollat Cynthia vultus. Nempe, etc. See also Claudian 15.495: Lunaque conceptis livescat turbida Coris.

¹⁷⁰Vegetius 4.41.

¹⁷¹Th. 31; Pliny 18.349. Compare Hermippus, *De Astrologia Dialogus* 19.176.

¹⁷²Varro, as quoted by Pliny 18.349.

¹⁷³Th. 51. Compare Aristotle, *Meteorologica* 3.3, 372 b.

blush the fiercer the tempest¹⁷⁴. If on the fourth day the (crescent) moon is vertical and has a clear ring around it, it shows that there will not be a storm before full moon¹⁷⁵.

Aratus condenses much lore about halos (811-817):

But if halos encircle all the Moon, set triple or double about her or only single—with the single ring, expect wind or calm; when the ring is broken, wind; when faint and fading, calm; two rings girding the Moon forebode storm; a triple halo would bring a greater storm, and greater still if black¹⁷⁶, and more furious still, if the rings are broken.

In accounting for the greater frequency of the halo by night Seneca says (1.2.11):

In order to produce the phenomenon, the atmosphere must neither be so thick as to exclude or dissipate the light that streams in on it, nor yet so thin and rare as to furnish no hold to the rays that fall upon it. This particular consistency is obtained at night: the sluggish air is at that time struck with the faint light from moon or stars without violence or rudeness, and, being thicker than it is wont to be by day, is tinged thereby¹⁷⁷.

Representative modern signs derived from lunar halos have been collected in Kentucky Superstitions (see note 3, above).

2576. A ring around the moon with a star in it brings clear weather.

2577. Circle around the moon, rain soon;
Circle around the sun, rain none.

2578. When the moon has a ring around it, there will be as many rainy days that week as there are stars in the ring.

2579. A ring around the moon is a sign of rain or bad weather, which will begin in as many days as there are stars enclosed in the circle.

2580. The number of rings around the moon shows how many days there will be before the rain.

2581. A circle around the moon with two stars in it is a sign that it will rain in two days.

2582. If there are seven stars in a circle around the moon, there will be rain for seven hours.

2583. The presence of two rings around the full moon brings snow within twenty-four hours.

2590. If there is a ring around the moon, rain may be expected. The nearer it is, the sooner will the rain come.

In Paul et Virginie, by Bernardin de Saint-Pierre, the weather conditions preceding a shipwreck are partially described as follows: "La lune était levée; on voyait autour d'elle trois grandes cercles noirs". One inevitably recalls in this connection the words of Longfellow in *The Wreck of the Hesperus*:

Then up and spake an old Sailor
Had sailed to the Spanish Main,
"I pray thee, put into yonder port,
For I fear a hurricane.

.....
Last night the moon had a golden ring,
And tonight no moon we see!"

"The skipper, he blew a whiff from his pipe,
And a scornful laugh laughed he.

So persistent is the association of the lunar halo with shipwreck that it seems worth while to quote still an-

other passage, from a poem by Falconer, called *The Shipwreck* (Canto I):

The waning moon, behind a wat'ry shroud,
Pale glimmer'd o'er the long protracted cloud;
A mighty halo round her silver throne,
With parting meteors cross'd, portentous shone:
This in the troubled sky full oft prevails,—
Oft deem'd a signal of tempestuous gales.

In *The London Illustrated News*¹⁷⁸ I find the following sentences:

A lunar halo, or moon-ring... is a somewhat rare phenomenon in this country. The weather prophet knows only too well that, when one does appear, it nearly always portends an unpleasant rain and squall.

At Whitby, when the moon is surrounded by a halo with watery clouds, the seamen say there will be a change of weather, for the "moon dogs" are about¹⁷⁹.

MOCK MOONS

Although references to two or more moons are fairly numerous in ancient literature¹⁸⁰, I have found no passage associating them with the weather. Theophrastus seems to have tried to make his collection of weather proverbs complete and he had a number of places where it would have been fitting to mention weather associations of the moon. Mock moons are not mentioned in the groups of weather signs made by Aratus, Vergil, Pliny, and Vegetius.

In modern lore the following belief is held:

If two or three moons appear at a time (which is usually two or three days after the full), it presages great rain and wind and unseasonable weather for a long time to follow¹⁸¹.

ECLIPSES OF THE MOON AND SUN

Storms are lulled at either lunar or solar eclipses, but especially when heat follows rain or rain follows heat¹⁸². We are told, however, that an eclipse of the sun on the last day of the old moon or the first of the new moon will make more violent certain disturbances in the air and on the water, since the rays of the sun are hidden or weakened¹⁸³. The Chaldeans believed that eclipses, as well as earthquakes and comets, caused wind, rain, and heat¹⁸⁴. In explaining why earthquakes sometimes coincide with lunar eclipses Aristotle says¹⁸⁵:

When the earth is on the point of being interposed, but the light and heat of the sun has not quite vanished from the air but is dying away, the wind which causes the earthquake before the eclipse, turns off into the earth, and calm ensues. For there often are winds

¹⁷⁸162.325 (March 3, 1923). This page contains a drawing of a lunar halo made by Scriven Bolton, an astronomer-artist.

¹⁷⁹T. F. Thiselton Dyer, *English Folk-Lore*, 38 (London, 1880). For other lore of lunar halos see Burdick, *Magic and Husbandry: The Folk-Lore of Agriculture*, 122 (The Otsenigo Publishing Co., Binghamton, New York, 1905); Inwards, 66-67; Humphreys, 36-40; Marvin, 210.

¹⁸⁰Livy 22.1.10; Pliny 2.99; Cicero, *De Divinatione* 1.97; Julius Obsequens 32 (92); Zonaras 8.20. See also Pease, page 269 of the work cited in note 97, above. Five moons are mentioned by Shakespeare, *King John* 4.2.

¹⁸¹Inwards, 65. See also 63.

¹⁸²Pliny 2.195.

¹⁸³A spurious work of S. Eustathius Antiochenus. See Migne, *Patrologia Graeca* 18.721. Vegetius tells us (4.40) that the inter-lunar period was especially dreaded because of its storms.

¹⁸⁴Diodorus 2.30.5. Aristotle, *Problemata* 26.18, asks why it is that winds regularly precede eclipses.

¹⁸⁵*Meteorologica* 2.8, 367 b (E. W. Webster's translation).

¹⁷⁴Aratus 796-798. ¹⁷⁵Pliny 18.348.

¹⁷⁶See also Pliny 18.349; Geop. 1.3.1.

¹⁷⁷John Clarke's translation.

before eclipses: at nightfall if the eclipse is at mid-night, and at midnight if the eclipse is at dawn. They are caused by the lessening of the warmth from the moon when its sphere approaches the point at which the eclipse is going to take place. So the influence which restrained and quieted the air weakens and the air moves again and a wind rises, and does so later, the later the eclipse.

Eclipses are still supposed to exercise an influence upon the weather. "Eclipse weather is a popular term in the South of England for the weather following an eclipse of the sun or moon, and it is vulgarly esteemed tempestuous and not to be depended on by the husbandman"¹⁸⁶. According to one of our own popular beliefs, "It always rains for five days in succession after an eclipse of the sun"¹⁸⁷. Bacon, *Historia Ventorum*, says that eclipses of the moon are usually accompanied by winds, those of the sun by fair weather, but that neither kind is attended by rain.

ASTROLOGY AND THE MOON

I shall give but a few illustrations of the astrological weather lore of the moon. The predictions are of the same general character as those for the sun.

If when the <crescent> moon is in Cancer one arm extends beyond the other, there will be no rainfall¹⁸⁸. In case the horns <of the moon> approach each other while the moon is rising in Virgo, there will be a down-pour sufficient to destroy crops¹⁸⁹. Should the left horn seem to extend farther than the other when the moon is in Aries, there will a drought and a shortage of food¹⁹⁰.

If the moon is found in Aries on June 14, there will be mist and thunderings and hail and trouble for the trees because of violent winds. And there will be whirling of the air and dry will be the atmosphere from the pestilential heat. If as day dawns on July 20 the moon is found in Aries, Eurus will generally prevail during the year, with the other winds mingling with it. The winter will be windy and cold and snowy and there will be continual rains. These prognostics and a long list of similar ones derived from the presence of the moon in the various signs of the zodiac on the same days are to be found in *Catalogus Codicum Astrologorum Graecorum*, 7.183-187¹⁹¹. Lydus devotes a long chapter (*De Ostentis* 42) to the kinds of weather that may be expected when the moon is in the signs of the zodiac.

At times the weather significance of the presence of the moon in the signs of the zodiac will depend upon general weather conditions prevailing below the zodiacal circle or even upon the occurrence of earthquakes. If there is a mist while the moon is in Capricorn, hail will fall¹⁹²; but if it thunders by night

while the moon is in this sign, there will be severe storms, shipwrecks and earth tremors¹⁹³. In case an earthquake occurs from the ninth to the nineteenth of the month while the moon is in Gemini, rain will fail and cattle will go hungry; from the twenty-fifth to the thirtieth such an event means great storms¹⁹⁴.

Needless to say, agricultural operations were likewise regulated (as they often are to-day) by the presence of the moon in the various signs of the zodiac¹⁹⁵.

From this mass of moon maxims Vergil selected only a few¹⁹⁶, but he seems to have found them more suitable material for poetic treatment than any other group of weather signs:

If wisely you shall watch the swift-wheeled sun
And moon in ordered change, no morrow morn
Will disappoint, nor eve of flattering calm
Betray and snare. When the first crescent moon,
Now reassembling her resurgent fires,
Clasps a dark mist betwixt her shadowed horns¹⁹⁷,
Then for the farmer-folk and out at sea
Vast storm is brewing; but if maiden blush¹⁹⁸
O'erspread her face, then wind; the golden moon
Glow's red in wind; but if—the surest sign—
She shines clear the fourth night and travels heaven
With undiminished horns, then all that day,
And all succeeding till the month is done,
Will bring nor rain nor wind; and safe on shore
The sailors sing with Panopaea's praise
Glaucus and Melicertes, Ino's child¹⁹⁹.

The Hexaemeral literature repeats much of the traditional classical weather lore. The Christian Fathers introduce it in commenting on Genesis 1.14:

And God said, Let there be lights in the firmament of the heaven to divide the day from the night; and let them be for signs, and for seasons, and for days and years.

The lengthiest collections are in Eustathius, *Hexaemeri Metaphrasis*, 6.4 (Migne, *Patrologia Latina* 53.924-925), and in Eustathius Antiochenus *Episcopus*, *Spuria* (Migne, *Patrologia Graeca* 18.720-721)²⁰⁰.

Much general weather lore of the moon, chiefly contemporary, may be found in Dunwoody, 59-64; Garriott, 27-28, 36-37; Swainson, 182-192; Thomas, *passim*; Timothy Harley, *Moon Lore* (in this book there is a chapter on Weather Lore of the Moon)²⁰¹,

¹⁸⁶Lydus, *De Ostentis* 39. For data of a similar character see sections 17, 18, 39, 40, 41, and also *Geop.* 1.10.5, 11.

¹⁸⁷Lydus, *De Ostentis* 18.

¹⁸⁸See, for example, Pliny 18.200; *Geop.* 5.46.

¹⁸⁹*Georgics* 1.424-437 (T. C. Williams's translation).

¹⁹⁰In a well-intentioned and clear note on this line B. H. Kennedy explains that, when the new moon is bright enough to receive rays from the earth and to reflect them to earth, the condition is known as "the old moon in the arms of the new". He concludes his note as follows: "If the air is vaporous, the earth's rays are lost to sight, and the moon appears as described by Virgil here". Failure to notice the final remark has led some scholars to state that the line actually means "the old moon in the arms of the new".

¹⁹¹With this line compare the words of Claudian (8.426-428): *quo saucia vento decolor iratos attollat Cynthia vultus. Nempae irae signum est rubor oris.*

¹⁹²Other groups of weather maxims of the moon are to be found in Aratus 778-818; Pliny 18.347-350; Vegetius 4.41. Much lore occurs sporadically in Theophrastus.

¹⁹³Other references in Migne are Michael Glyca, *Annales* 1.25-26, *Patrologia Graeca* 158.72; Theodoretus, *Quaestiones in Genesim*, *Patrologia Graeca* 80.96; Angelomus, *Commentarius in Genesim*, *Patrologia Latina* 115.120; Bede, *Hexaemeron*, *Patrologia Latina* 91.24; Rupertus, *Abbas Tuitensis*, *Patrologia Latina* 167.236-237.

¹⁹⁴Many signs are noted by Fletcher S. Bassett, *Legends and Superstitions of the Sea and of Sailors in All Lands and at All Times* (Belford, Clarke and Co., Chicago and New York, 1885.)

¹⁸⁶Inwards, 64. ¹⁸⁷Thomas, No. 2658.

¹⁸⁸Lydus, *De Ostentis* 19.

¹⁸⁹*Ibidem.* ¹⁹⁰Lydus, *De Ostentis* 18.

¹⁹¹The astrologers of a certain city named Kanbalu, which Marco Polo visited, were extremely industrious in the interpretation of planetary movements. Their activities are thus described in *The Travels of Marco Polo the Venetian*, Book 2, Chapter 25:

"They discover therein what the state of the weather shall be, from the paths and configurations of the planets in the different signs, and thence foretell the peculiar phenomena of each month: that in such a month, for instance, there shall be thunder and storms; in another, diseases, mortality, wars, discords, conspiracies".

¹⁹²Lydus, *De Ostentis* 17.

O. Freiherr von Reinsberg-Düringsfeld, *Das Wetter im Sprichwort*, 35-37²⁰². Bacon, *Historia Ventorum*, repeats many classical items.

A little aside from my subject is the influence of the moon, especially as it waxes and wanes, upon agricultural operations. Excellent illustrations of the ancient beliefs about the moon's powers in this respect can be found in Professor Eugene Tavenner's paper, *The Roman Farmer and the Moon*²⁰³. Many contemporary beliefs are listed by Swainson, 188-191, and by Garriott, 37. Anyone who has lived in the country should be able to recall other maxims. I have heard a number of them on the lips of my grandparents.

Commenting upon the popular belief that the moon appreciably controls the weather, Humphreys writes (40):

Careful studies of the records, however, have shown that the moon's influence on the weather, beyond a very small tidal effect on the atmosphere, as indicated by the barometer, is entirely negligible.

And Garriott says (25):

The sun, moon, and stars indicate impending changes only so far as their appearance is affected by existing atmospheric conditions.

I hope in a future article to discuss other aspects of the weather lore of the heavens.

UNIVERSITY OF MICHIGAN

EUGENE S. MCCARTNEY

P. Ovidii Nasonis *Tristium Liber Secundus*. Edited, With an Introduction, Translation, and Commentary, by S. G. Owen. Oxford: at the Clarendon Press; New York: Oxford University Press, American Branch (1924). Pp. vii + 296. \$7.

The last few years have witnessed a revival in Ovidian studies. Note Professor E. K. Rand's book, *Ovid and his Influence* (*THE CLASSICAL WEEKLY* 20.143-145), Professor A. L. Wheeler's translation of the *Tristia* and *Ex Ponto* (Loeb Classical Library: *THE CLASSICAL WEEKLY* 18.170-171), a German translation of the *Ars Amatoria*, by Franz Burger-München, and an English rendering by F. A. Wright (both reviewed in *THE CLASSICAL WEEKLY* 18.109-110), Professor Némethy's Latin commentary on the *Remedia Amoris*, and an announced revised edition of the *Ars Amatoria*, by P. Brandt. To this list Professor Owen's masterpiece, an edition of the *Tristia*, Book 2, is to be added, and warmly welcomed, especially since no other adequate commentary on the second book of the *Tristia* is in existence.

Among Ovid's elegiac creations the second book of the *Tristia* occupies a special, if not the most conspicuous, place. This is due to two facts: (1) contrasted with other books, it is a continuous elegiac poem, of 578 verses, (2) it constitutes the poet's defence of his *Ars Amatoria*, of himself and his conduct (1, 48), with the aim of securing a mitigation of his

sentence of banishment. It is, to use Professor Owen's words (Preface, v), "... an apologetic essay, ingenious in argument and littered with allusions, the full appreciation of which is not easy..." Professor Owen, it is seen, is fully aware of the difficulty of his task. But whom else can we expect to cope with the difficulties of this book of the *Tristia*? Professor Owen's previous work on Ovid, the result of a life-long study of that poet, makes him the outstanding Ovidian scholar in the English-speaking world.

The contents of the book are as follows: Preface (v-vii); Introduction (1-89); Sigla (90); Text and Translation (92-120); Commentary (121-289); Index (291-296).

The Introduction is subdivided into five chapters. Chapter I (1-47) discusses the circumstances which led to Ovid's banishment and to the composition of the *Tristia*. It includes a biography of Ovid and a discussion of the chronology of Ovid's works. This enables Professor Owen to analyze and to evaluate the many features of Ovid's versatile genius. The human side of the character of Ovid, of the *nimum amator ingenii sui*, is also stressed, with fine understanding of the poet's psychology. The banishment of Ovid to permanent exile constitutes in Professor Owen's opinion a black stain on the character of Augustus (36). Professor Owen rejects (9-10) the date given by Masson for Ovid's banishment (9 A. D.), and accepts, after a reexamination of passages, 8 A. D., a date advocated by Graeber, Schulz, Burrage, and accepted by Schanz, Wheeler, and myself (in my dissertation, *Prolegomena to an Edition of the Panegyricus Messalae*, etc., 8-10 [*THE CLASSICAL WEEKLY* 19.238-239]). The most important part of this chapter is the attempt to solve the still unsolved puzzle, i. e. the reasons which led to Ovid's exile. Professor Owen believes (8) that Augustus suspected some connection between the teachings of the poet as expounded in the *Ars Amatoria* and Julia's outrageous conduct. But this was ten years before the order of *relegatio* was issued. Why did Augustus wait so long? The answer (19) is that, though the *Ars* was the official reason for the poet's exile, it was not the only reason which prompted the Emperor to banish Ovid¹. Professor Owen tries to discover this specific reason; he rejects the theories of all scholars who seek the solution by connecting Ovid with Julia's adultery (20-26). "The source of Ovid's misfortune", he says (26), "must be sought elsewhere, and was probably political rather than domestic..." On page 31 he maintains that "... It seems, however, probable that his unknown action was political and gave offence to Livia and Tiberius..." especially since Ovid associated himself with the friends of Germanicus, whom Tiberius feared on account of his popularity (34); therefore Ovid ap-

²⁰²Published by Hermann Fries (Leipzig, 1864).

²⁰³Transactions of the American Philological Association 49.67-82. I regard Professor Tavenner's paper as a model treatment of this type of subject.

<In my review of Professor Wheeler's version of the *Tristia* and the *Epistulae ex Ponto*, *THE CLASSICAL WEEKLY* 18.170, I set aside by side his discussion and Professor Owen's of the causes of Ovid's banishment. The book here under review appeared after Professor Wheeler's book was published. Professor Wheeler maintained (xxiii) that "Augustus's own attitude, as shown by Ovid, indicates that the poet's sin was not a very heavy one.... It is plain that Augustus and after his death Tiberius, who continued so religiously the policies of his predecessor, were quite satisfied merely to have Ovid out of the way..." C. K.>



Greek and Roman Weather Lore of the Sun and the Moon (Concluded)

Author(s): Eugene S. McCartney

Source: *The Classical Weekly*, Vol. 22, No. 5 (Oct. 29, 1928), pp. 33-37

Published by: [Classical Association of the Atlantic States](#)

Stable URL: <http://www.jstor.org/stable/4389206>

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The Classical Weekly

VOLUME XXII, No. 5

MONDAY, OCTOBER 29, 1928

WHOLE No. 589

GREEK AND ROMAN WEATHER LORE OF THE SUN AND THE MOON

(Concluded from page 31)

THE MOON

'Twas Jove's own grace that by sure signs
Men prophesy of droughts, rains, frost and winds,
Watching the admonitions of the moon,
Marking what bodes a gale, what oft-seen signs
Bid herdsmen keep their cattle nigh the barn¹²⁷.

With these lines Vergil introduces his long list of weather signs. Vegetius¹²⁸ describes the effect of the moon upon the weather very succinctly when he states that it reveals as in a mirror the changes from clear to stormy and from stormy to clear. We are told that changes in the weather occurred at the main divisions of the night¹²⁹, but moonrise is the time that is mentioned most frequently.

Much stress is laid also upon the effect of various periods within the month¹³⁰. Theophrastus explains (5) that "the meetings of the months are stormy, because the moon's light fails from the fourth day from the end of one month to the fourth day from the beginning of the next". The days of the interlunary period were especially feared by sailors and even the ignorant knew of their special terrors¹³¹.

The full moon and the eighth and the fourth days make divisions into halves, so that one should make the new moon the starting-point of one's survey. A change most often takes place on the fourth day, or, failing that, on the eighth, or failing that, at the full moon; after that the periods are from the full moon to the eighth day from the end of the month, from that to the fourth day from the end, and from that to the new moon¹³².

Aratus says (781-782) that the horns of the crescent moon foretell the character of the coming month, but later on (806-807) he restricts this statement to the period of the half-moon. Theophrastus asserts (12) that whatever signs the crescent moon gives she gives when she is three days old. Vergil¹³³ prefers the fourth day. At this time the Egyptians too paid most attention to the moon¹³⁴. If the moon shall not have appeared before the fourth day and if Favonius is blowing, the entire month will be stormy. On the fourth day the moon determines the character of the winds for the next month¹³⁵. If on the sixteenth day the moon appears extremely fiery, it forebodes fierce storms¹³⁶.

Aratus likewise urges men (799-801) to "scan her when full and when half-formed on either side of full, as she waxes from or wanes again to crescent form, and

from her hue forecast each month". Theophrastus informs us (12) that the indications are less certain when the moon is not full.

Similar ideas are still current¹³⁷. In Longfellow's *The Golden Legend*¹³⁸ the Padrone exclaims:

"I must entreat you, friends, below!
The angry storm begins to blow,
For the weather changes with the moon."

The notion that the weather changes with the moon's quarterings is still held with great vigour in England <and elsewhere!>... That educated people to whom exact weather records are accessible should still find satisfaction in the fanciful lunar rule, is an interesting case of intellectual survival¹³⁹.

The absence of all connection between the moon's phases and the weather is cleverly stated in the following verses¹⁴⁰:

The moon and the weather
May change together;
But change of the moon
Does not change the weather.
If we'd no moon at all,
And that may seem strange,
We still should have weather
That's subject to change.

THE CRESCENT MOON

The lore of the crescent moon is elaborate. Aratus gives a lengthy list of signs (778-795):

Scan first the horns on either side the Moon. For with varying hue from time to time the evening paints her and of different shape are her horns at different times as the Moon is waxing—one form on the third day and another on the fourth. From them thou canst learn touching the month that is begun. If she is slender¹⁴¹ and clear about the third day, she heralds calm: if slender and very ruddy, wind; but if thick and with blunted horns she show but a feeble light on the third and fourth night, her beams are blunted by the South wind or imminent rain¹⁴². If on the third night¹⁴³ neither horn nod forward or lean backward, if vertical they curve their tips on either side, winds from the West will follow that night. But if still with vertical crescent she bring the fourth day too, she gives warning of gathering storm¹⁴⁴. If her upper horn nod forward, expect thou the North wind, but if it lean backward, the South¹⁴⁵.

Theophrastus adds a few variations (27):

¹³⁷For examples see Swainson, 184-185, 191-192; Inwards, 71-72.
¹³⁸Near the end of Part V.

¹³⁹Edward B. Tylor, *Primitive Culture*⁶, 1.130 (John Murray, London, 1920). See also Longstreth, 178-179.

¹⁴⁰This rhyme, by an unnamed weather-observer, is quoted in *Notes and Queries*, September 23, 1882 (page 246).

¹⁴¹Lucan 5.548 says of the moon: *Nec duxit recto tenuata cacumina cornu*.

¹⁴²See also Pliny 18.347, 349; Geop. 1.3.1.

¹⁴³Compare Lucan 1.217-218: "...auxerat undas tertia iam gravido pluvialis Cynthia cornu..."; Valerius Flaccus 2.56: *gravido surrexit Cynthia cornu*.

¹⁴⁴Compare Pliny 18.348: *Si quarto die luna erit directa, magnam tempestatem in mari praesagiet...*

¹⁴⁵Aratus is quoted by Isidorus, *De Natura Rerum* 38.3.

¹²⁷Georgics 1.351-355 (T. C. Williams's translation).

¹²⁸De Re Militari 4.41. ¹²⁹Th. 9.

¹³⁰See Scholium on Aratus 733. ¹³¹Vegetius 4.40.

¹³²Th. 8. Compare Aratus 805-810; Pliny 18.350.

¹³³Georgics 1.432. ¹³⁴Pliny 18.347. ¹³⁵Pliny 2.128.

¹³⁶Pliny 18.349.

Again, if while a north wind blows, the horns of the crescent moon stand out straight, westerly winds will generally succeed, and the rest of the month will be stormy. When the upper horn of the crescent moon is bent, northerly winds will prevail for that part of the month: when the lower horn is bent, southerly winds will prevail. If however the horns up to the fourth day point straight and have not a graceful bend inwards but round to a circle, it will generally be stormy till the middle of the month¹⁴⁶.

When the moon rises with the upper horn darkened, there will be rain as it wanes, with the lower one darkened, rain before the full moon, with its middle darkened¹⁴⁷, rain at full moon. From another source we learn that, if the tip of the crescent moon has black spots on it at the first of the month, there will be rains, and that, if the spots are in the middle, there will be clear weather when the horns are full¹⁴⁸.

Those mists which come down when the moon is in its first quarter indicate breezes for that period, those which come down when the moon is in its third quarter indicate rain. And the more mists come down when the moon is assuming either shape, the more certainly is the result just mentioned indicated¹⁴⁹.

In English there is considerable weather lore of the moon that survives from antiquity, but I believe that our own lore expresses it more picturesquely.

Every one knows that when a line joining the horns or points of the moon's crescent lies nearly perpendicular to the horizon so that the crescent cannot hold water¹⁵⁰, the moon is popularly called a *wet moon*, and that when it is almost horizontal, so that the crescent can apparently hold water, the moon is termed a *dry moon*, and is commonly considered a sign of fair weather¹⁵¹.

There are many other ways of indicating the positions of the crescent moon. When its horns are turned upwards, it is said to be lying on its back¹⁵². The Indians said that, when the moon lay sufficiently on its side to allow a powder horn to be hung on its tip, the weather during that moon would be dry¹⁵³. Under such circumstances English fishermen say you may hang your hat upon it¹⁵⁴. In Adam Bede (Chapter 18) George Eliot puts the following words into the mouth of old Martin:

It 'ud ha' been better luck if they'd ha' buried him i' the forenoon when the rain was fallin'¹⁵⁵; there's no likelihoods of a drop now, an' the moon lies like a boat there, dost see? That's a sure sign o' fair weather; there's a many as is false, but that's sure.

In Thomas Dekker's *Match Me in London*, Act 1, the king says:

My Lord, doe you see this change i'th the Moone?
Sharp hornes
Doe threaten windy weather, . . .

¹⁴⁶See also Th. 38.

¹⁴⁷Pliny 18.349. See also Servius on Vergil, *Georgics* 1.428; Lucan 5.547.

¹⁴⁸Nigidius as quoted by Isidorus, *De Natura Rerum* 38.2. See also Bede, *De Natura Rerum* 36.

¹⁴⁹Th. 56.

¹⁵⁰"If the moon of the first quarter is tipped so that water would pour out of the curve, it means a rainy month": so *Journal of American Folk-Lore* 36.8. See also Bergen, 110.

¹⁵¹J. R. Kippax, *The Call of the Stars*, 338.

¹⁵²A common expression. See, for instance, Thomas, No. 2574. Bergen, 110. See also Thomas, No. 2575; *Journal of American Folk-Lore* 36.16.

¹⁵³T. F. Thielton Dyer, *English Folk-Lore*, 40 (London, 1880).

¹⁵⁴"Happy are the dead that the rain rains on" is an old superstition.

This sign has reason behind it. When the moon's horns appear sharp, there are no temperature inequalities in the atmosphere, "and the natural inference is that there are strong overhead winds which later may reach the surface of the earth"¹⁵⁶.

The condition indicated by Theophrastus (27) in describing the horns rounding to a circle has long been vividly described in English as "the old moon in the new moon's arms"¹⁵⁷. An instance may be found in an old ballad called *Sir Patrick Spens*¹⁵⁸:

"I saw the new moon late yestreen,
Wi' the auld moon in her arm;
And if we gang to sea, master,
I fear we'll come to harm"¹⁵⁹.

BRIGHTNESS AND COLORS OF MOON

The varying hues of the moon, as well as its varying shapes, afford indications of the weather¹⁶⁰. The moon rising bright and clear signifies clear weather¹⁶¹. This statement is sometimes made specifically of the half-moon¹⁶² and the full moon¹⁶³. "Again, it indicates fair weather if the outline of the moon on the third day is bright"¹⁶⁴.

When the moon is dusky¹⁶⁵ or has black spots¹⁶⁶, it means rain; when it is reddened¹⁶⁷ or has red spots¹⁶⁸, it means wind. *Nempe irae signum est rubor oris*¹⁶⁹. Should the moon be colored a mixture of dark and red, clouds and raging squalls will follow¹⁷⁰.

HALOS AND THE MOON

"A halo about the moon signifies wind more certainly than a halo about the sun: but in either case, if there is a break in the halo, it indicates wind, which will come from the quarter in which the break is"¹⁷¹. Varro declares that, if the full moon has a circle about it, wind is to be looked for in the quarter in which it shines the brightest¹⁷².

The even formation and disappearance of a halo signify fair weather¹⁷³. On the third day a complete halo blushing red foretells storm, and the ruddier the

¹⁵⁶Humphreys, 42.

¹⁵⁷"When the moon shows a very thin crescent, the dark portion of the lunar globe can be dimly seen standing out against the sky, shining with a faint soft light, called the ashen light—la lumière cendrée". So J. R. Kippax, *The Call of the Stars*, 337. This aspect of the moon is illustrated in Plate 27.

¹⁵⁸The Ballad Book (edited by William Allingham), 62 (Macmillan and Co., London, 1898).

¹⁵⁹For other lore of the crescent moon see Inwards, 70-71.

¹⁶⁰Aratus 779-781.

¹⁶¹Th. 50; Pliny 18.347. Compare Aratus 802, and Vergil, *Georgics* 1.396: nec fratris radii obnoxia surgere Luna <videtur>

¹⁶²Geop. 1.2.1.

¹⁶³Th. 50; Geop. 1.2.1. Varro, cited by Pliny 18.348, says that calm days are signified if the full moon is clear in the middle; if the full moon is ruddy, winds are signified. See also Seneca, *Phaedra* 751-755.

¹⁶⁴Th. 51. Compare Aratus 783; Geop. 1.2.1.

¹⁶⁵Th. 12, 27; Pliny 18.347; Vegetius 4.41; Geop. 1.2.1, 1.3.1.

¹⁶⁶Th. 27; Aratus 804.

¹⁶⁷Th. 12, 27; Aratus 803; Pliny 18.347-348; Quintilian 5.9.15-16; Lucan 5.549; Isidorus, *De Natura Rerum* 38.2; Vegetius 4.41; Geop. 1.2.1, 1.3.1; Bede, *De Natura Rerum* 36: Luna quarta si rubeat quasi aurum, ventos ostendit.

¹⁶⁸Th. 27.

¹⁶⁹Claudian 8.426-428: quo saucia vento decolor iratos attollat Cynthia vultus. Nempe, etc. See also Claudian 15.495: Lunaque conceptis livescat turbida Coris.

¹⁷⁰Vegetius 4.41.

¹⁷¹Th. 31; Pliny 18.349. Compare Hermippus, *De Astrologia Dialogus* 19.176.

¹⁷²Varro, as quoted by Pliny 18.349.

¹⁷³Th. 51. Compare Aristotle, *Meteorologica* 3.3, 372 b.

blush the fiercer the tempest¹⁷⁴. If on the fourth day the (crescent) moon is vertical and has a clear ring around it, it shows that there will not be a storm before full moon¹⁷⁵.

Aratus condenses much lore about halos (811-817):

But if halos encircle all the Moon, set triple or double about her or only single—with the single ring, expect wind or calm; when the ring is broken, wind; when faint and fading, calm; two rings girding the Moon forebode storm; a triple halo would bring a greater storm, and greater still if black¹⁷⁶, and more furious still, if the rings are broken.

In accounting for the greater frequency of the halo by night Seneca says (1.2.11):

In order to produce the phenomenon, the atmosphere must neither be so thick as to exclude or dissipate the light that streams in on it, nor yet so thin and rare as to furnish no hold to the rays that fall upon it. This particular consistency is obtained at night: the sluggish air is at that time struck with the faint light from moon or stars without violence or rudeness, and, being thicker than it is wont to be by day, is tinged thereby¹⁷⁷.

Representative modern signs derived from lunar halos have been collected in Kentucky Superstitions (see note 3, above).

2576. A ring around the moon with a star in it brings clear weather.

2577. Circle around the moon, rain soon;
Circle around the sun, rain none.

2578. When the moon has a ring around it, there will be as many rainy days that week as there are stars in the ring.

2579. A ring around the moon is a sign of rain or bad weather, which will begin in as many days as there are stars enclosed in the circle.

2580. The number of rings around the moon shows how many days there will be before the rain.

2581. A circle around the moon with two stars in it is a sign that it will rain in two days.

2582. If there are seven stars in a circle around the moon, there will be rain for seven hours.

2583. The presence of two rings around the full moon brings snow within twenty-four hours.

2590. If there is a ring around the moon, rain may be expected. The nearer it is, the sooner will the rain come.

In Paul et Virginie, by Bernardin de Saint-Pierre, the weather conditions preceding a shipwreck are partially described as follows: "La lune était levée; on voyait autour d'elle trois grandes cercles noirs". One inevitably recalls in this connection the words of Longfellow in *The Wreck of the Hesperus*:

Then up and spake an old Sailor
Had sailed to the Spanish Main,
"I pray thee, put into yonder port,
For I fear a hurricane.

.....
Last night the moon had a golden ring,
And tonight no moon we see!"

"The skipper, he blew a whiff from his pipe,
And a scornful laugh laughed he.

So persistent is the association of the lunar halo with shipwreck that it seems worth while to quote still an-

other passage, from a poem by Falconer, called *The Shipwreck* (Canto I):

The waning moon, behind a wat'ry shroud,
Pale glimmer'd o'er the long protracted cloud;
A mighty halo round her silver throne,
With parting meteors cross'd, portentous shone:
This in the troubled sky full oft prevails,—
Oft deem'd a signal of tempestuous gales.

In *The London Illustrated News*¹⁷⁸ I find the following sentences:

A lunar halo, or moon-ring... is a somewhat rare phenomenon in this country. The weather prophet knows only too well that, when one does appear, it nearly always portends an unpleasant rain and squall.

At Whitby, when the moon is surrounded by a halo with watery clouds, the seamen say there will be a change of weather, for the "moon dogs" are about¹⁷⁹.

MOCK MOONS

Although references to two or more moons are fairly numerous in ancient literature¹⁸⁰, I have found no passage associating them with the weather. Theophrastus seems to have tried to make his collection of weather proverbs complete and he had a number of places where it would have been fitting to mention weather associations of the moon. Mock moons are not mentioned in the groups of weather signs made by Aratus, Vergil, Pliny, and Vegetius.

In modern lore the following belief is held:

If two or three moons appear at a time (which is usually two or three days after the full), it presages great rain and wind and unseasonable weather for a long time to follow¹⁸¹.

ECLIPSES OF THE MOON AND SUN

Storms are lulled at either lunar or solar eclipses, but especially when heat follows rain or rain follows heat¹⁸². We are told, however, that an eclipse of the sun on the last day of the old moon or the first of the new moon will make more violent certain disturbances in the air and on the water, since the rays of the sun are hidden or weakened¹⁸³. The Chaldeans believed that eclipses, as well as earthquakes and comets, caused wind, rain, and heat¹⁸⁴. In explaining why earthquakes sometimes coincide with lunar eclipses Aristotle says¹⁸⁵:

When the earth is on the point of being interposed, but the light and heat of the sun has not quite vanished from the air but is dying away, the wind which causes the earthquake before the eclipse, turns off into the earth, and calm ensues. For there often are winds

¹⁷⁸162.325 (March 3, 1923). This page contains a drawing of a lunar halo made by Scriven Bolton, an astronomer-artist.

¹⁷⁹T. F. Thiselton Dyer, *English Folk-Lore*, 38 (London, 1880). For other lore of lunar halos see Burdick, *Magic and Husbandry: The Folk-Lore of Agriculture*, 122 (The Otsenigo Publishing Co., Binghamton, New York, 1905); Inwards, 66-67; Humphreys, 36-40; Marvin, 210.

¹⁸⁰Livy 22.1.10; Pliny 2.99; Cicero, *De Divinatione* 1.97; Julius Obsequens 32 (92); Zonaras 8.20. See also Pease, page 269 of the work cited in note 97, above. Five moons are mentioned by Shakespeare, *King John* 4.2.

¹⁸¹Inwards, 65. See also 63.

¹⁸²Pliny 2.195.

¹⁸³A spurious work of S. Eustathius Antiochenus. See Migne, *Patrologia Graeca* 18.721. Vegetius tells us (4.40) that the inter-lunar period was especially dreaded because of its storms.

¹⁸⁴Diodorus 2.30.5. Aristotle, *Problemata* 26.18, asks why it is that winds regularly precede eclipses.

¹⁸⁵*Meteorologica* 2.8, 367 b (E. W. Webster's translation).

¹⁷⁴Aratus 796-798. ¹⁷⁵Pliny 18.348.

¹⁷⁶See also Pliny 18.349; Geop. 1.3.1.

¹⁷⁷John Clarke's translation.

before eclipses: at nightfall if the eclipse is at mid-night, and at midnight if the eclipse is at dawn. They are caused by the lessening of the warmth from the moon when its sphere approaches the point at which the eclipse is going to take place. So the influence which restrained and quieted the air weakens and the air moves again and a wind rises, and does so later, the later the eclipse.

Eclipses are still supposed to exercise an influence upon the weather. "Eclipse weather is a popular term in the South of England for the weather following an eclipse of the sun or moon, and it is vulgarly esteemed tempestuous and not to be depended on by the husbandman"¹⁸⁶. According to one of our own popular beliefs, "It always rains for five days in succession after an eclipse of the sun"¹⁸⁷. Bacon, *Historia Ventorum*, says that eclipses of the moon are usually accompanied by winds, those of the sun by fair weather, but that neither kind is attended by rain.

ASTROLOGY AND THE MOON

I shall give but a few illustrations of the astrological weather lore of the moon. The predictions are of the same general character as those for the sun.

If when the <crescent> moon is in Cancer one arm extends beyond the other, there will be no rainfall¹⁸⁸. In case the horns <of the moon> approach each other while the moon is rising in Virgo, there will be a down-pour sufficient to destroy crops¹⁸⁹. Should the left horn seem to extend farther than the other when the moon is in Aries, there will a drought and a shortage of food¹⁹⁰.

If the moon is found in Aries on June 14, there will be mist and thunderings and hail and trouble for the trees because of violent winds. And there will be whirling of the air and dry will be the atmosphere from the pestilential heat. If as day dawns on July 20 the moon is found in Aries, Eurus will generally prevail during the year, with the other winds mingling with it. The winter will be windy and cold and snowy and there will be continual rains. These prognostics and a long list of similar ones derived from the presence of the moon in the various signs of the zodiac on the same days are to be found in *Catalogus Codicum Astrologorum Graecorum*, 7.183-187¹⁹¹. Lydus devotes a long chapter (*De Ostentis* 42) to the kinds of weather that may be expected when the moon is in the signs of the zodiac.

At times the weather significance of the presence of the moon in the signs of the zodiac will depend upon general weather conditions prevailing below the zodiacal circle or even upon the occurrence of earthquakes. If there is a mist while the moon is in Capricorn, hail will fall¹⁹²; but if it thunders by night

while the moon is in this sign, there will be severe storms, shipwrecks and earth tremors¹⁹³. In case an earthquake occurs from the ninth to the nineteenth of the month while the moon is in Gemini, rain will fail and cattle will go hungry; from the twenty-fifth to the thirtieth such an event means great storms¹⁹⁴.

Needless to say, agricultural operations were likewise regulated (as they often are to-day) by the presence of the moon in the various signs of the zodiac¹⁹⁵.

From this mass of moon maxims Vergil selected only a few¹⁹⁶, but he seems to have found them more suitable material for poetic treatment than any other group of weather signs:

If wisely you shall watch the swift-wheeled sun
And moon in ordered change, no morrow morn
Will disappoint, nor eve of flattering calm
Betray and snare. When the first crescent moon,
Now reassembling her resurgent fires,
Clasps a dark mist betwixt her shadowed horns¹⁹⁷,
Then for the farmer-folk and out at sea
Vast storm is brewing; but if maiden blush¹⁹⁸
O'erspread her face, then wind; the golden moon
Glow's red in wind; but if—the surest sign—
She shines clear the fourth night and travels heaven
With undiminished horns, then all that day,
And all succeeding till the month is done,
Will bring nor rain nor wind; and safe on shore
The sailors sing with Panopaea's praise
Glaucus and Melicertes, Ino's child¹⁹⁹.

The Hexaemeral literature repeats much of the traditional classical weather lore. The Christian Fathers introduce it in commenting on Genesis 1.14:

And God said, Let there be lights in the firmament of the heaven to divide the day from the night; and let them be for signs, and for seasons, and for days and years.

The lengthiest collections are in Eustathius, *Hexaemeri Metaphrasis*, 6.4 (Migne, *Patrologia Latina* 53.924-925), and in Eustathius Antiochenus *Episcopus*, *Spuria* (Migne, *Patrologia Graeca* 18.720-721)²⁰⁰.

Much general weather lore of the moon, chiefly contemporary, may be found in Dunwoody, 59-64; Garriott, 27-28, 36-37; Swainson, 182-192; Thomas, *passim*; Timothy Harley, *Moon Lore* (in this book there is a chapter on Weather Lore of the Moon)²⁰¹,

¹⁸⁶Lydus, *De Ostentis* 39. For data of a similar character see sections 17, 18, 39, 40, 41, and also *Geop.* 1.10.5, 11.

¹⁸⁷Lydus, *De Ostentis* 18.

¹⁸⁸See, for example, Pliny 18.200; *Geop.* 5.46.

¹⁸⁹*Georgics* 1.424-437 (T. C. Williams's translation).

¹⁹⁰In a well-intentioned and clear note on this line B. H. Kennedy explains that, when the new moon is bright enough to receive rays from the earth and to reflect them to earth, the condition is known as "the old moon in the arms of the new". He concludes his note as follows: "If the air is vaporous, the earth's rays are lost to sight, and the moon appears as described by Virgil here". Failure to notice the final remark has led some scholars to state that the line actually means "the old moon in the arms of the new".

¹⁹¹With this line compare the words of Claudian (8.426-428): *quo saucia vento decolor iratos attollat Cynthia vultus. Nempae irae signum est rubor oris.*

¹⁹²Other groups of weather maxims of the moon are to be found in Aratus 778-818; Pliny 18.347-350; Vegetius 4.41. Much lore occurs sporadically in Theophrastus.

¹⁹³Other references in Migne are Michael Glyca, *Annales* 1.25-26, *Patrologia Graeca* 158.72; Theodoretus, *Quaestiones in Genesim*, *Patrologia Graeca* 80.96; Angelomus, *Commentarius in Genesim*, *Patrologia Latina* 115.120; Bede, *Hexaemeron*, *Patrologia Latina* 91.24; Rupertus, *Abbas Tuitensis*, *Patrologia Latina* 167.236-237.

¹⁹⁴Many signs are noted by Fletcher S. Bassett, *Legends and Superstitions of the Sea and of Sailors in All Lands and at All Times* (Belford, Clarke and Co., Chicago and New York, 1885.)

¹⁸⁶Inwards, 64. ¹⁸⁷Thomas, No. 2658.

¹⁸⁸Lydus, *De Ostentis* 19.

¹⁸⁹*Ibidem.* ¹⁹⁰Lydus, *De Ostentis* 18.

¹⁹¹The astrologers of a certain city named Kanbalu, which Marco Polo visited, were extremely industrious in the interpretation of planetary movements. Their activities are thus described in *The Travels of Marco Polo the Venetian*, Book 2, Chapter 25:

"They discover therein what the state of the weather shall be, from the paths and configurations of the planets in the different signs, and thence foretell the peculiar phenomena of each month: that in such a month, for instance, there shall be thunder and storms; in another, diseases, mortality, wars, discords, conspiracies".

¹⁹²Lydus, *De Ostentis* 17.

O. Freiherr von Reinsberg-Düringsfeld, *Das Wetter im Sprichwort*, 35-37²⁰². Bacon, *Historia Ventorum*, repeats many classical items.

A little aside from my subject is the influence of the moon, especially as it waxes and wanes, upon agricultural operations. Excellent illustrations of the ancient beliefs about the moon's powers in this respect can be found in Professor Eugene Tavenner's paper, *The Roman Farmer and the Moon*²⁰³. Many contemporary beliefs are listed by Swainson, 188-191, and by Garriott, 37. Anyone who has lived in the country should be able to recall other maxims. I have heard a number of them on the lips of my grandparents.

Commenting upon the popular belief that the moon appreciably controls the weather, Humphreys writes (40):

Careful studies of the records, however, have shown that the moon's influence on the weather, beyond a very small tidal effect on the atmosphere, as indicated by the barometer, is entirely negligible.

And Garriott says (25):

The sun, moon, and stars indicate impending changes only so far as their appearance is affected by existing atmospheric conditions.

I hope in a future article to discuss other aspects of the weather lore of the heavens.

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EUGENE S. MCCARTNEY

P. Ovidii Nasonis *Tristium Liber Secundus*. Edited, With an Introduction, Translation, and Commentary, by S. G. Owen. Oxford: at the Clarendon Press; New York: Oxford University Press, American Branch (1924). Pp. vii + 296. \$7.

The last few years have witnessed a revival in Ovidian studies. Note Professor E. K. Rand's book, *Ovid and his Influence* (*THE CLASSICAL WEEKLY* 20.143-145), Professor A. L. Wheeler's translation of the *Tristia* and *Ex Ponto* (Loeb Classical Library: *THE CLASSICAL WEEKLY* 18.170-171), a German translation of the *Ars Amatoria*, by Franz Burger-München, and an English rendering by F. A. Wright (both reviewed in *THE CLASSICAL WEEKLY* 18.109-110), Professor Némethy's Latin commentary on the *Remedia Amoris*, and an announced revised edition of the *Ars Amatoria*, by P. Brandt. To this list Professor Owen's masterpiece, an edition of the *Tristia*, Book 2, is to be added, and warmly welcomed, especially since no other adequate commentary on the second book of the *Tristia* is in existence.

Among Ovid's elegiac creations the second book of the *Tristia* occupies a special, if not the most conspicuous, place. This is due to two facts: (1) contrasted with other books, it is a continuous elegiac poem, of 578 verses, (2) it constitutes the poet's defence of his *Ars Amatoria*, of himself and his conduct (1, 48), with the aim of securing a mitigation of his

sentence of banishment. It is, to use Professor Owen's words (Preface, v), "... an apologetic essay, ingenious in argument and littered with allusions, the full appreciation of which is not easy..." Professor Owen, it is seen, is fully aware of the difficulty of his task. But whom else can we expect to cope with the difficulties of this book of the *Tristia*? Professor Owen's previous work on Ovid, the result of a life-long study of that poet, makes him the outstanding Ovidian scholar in the English-speaking world.

The contents of the book are as follows: Preface (v-vii); Introduction (1-89); Sigla (90); Text and Translation (92-120); Commentary (121-289); Index (291-296).

The Introduction is subdivided into five chapters. Chapter I (1-47) discusses the circumstances which led to Ovid's banishment and to the composition of the *Tristia*. It includes a biography of Ovid and a discussion of the chronology of Ovid's works. This enables Professor Owen to analyze and to evaluate the many features of Ovid's versatile genius. The human side of the character of Ovid, of the *nimum amator ingenii sui*, is also stressed, with fine understanding of the poet's psychology. The banishment of Ovid to permanent exile constitutes in Professor Owen's opinion a black stain on the character of Augustus (36). Professor Owen rejects (9-10) the date given by Masson for Ovid's banishment (9 A. D.), and accepts, after a reexamination of passages, 8 A. D., a date advocated by Graeber, Schulz, Burrage, and accepted by Schanz, Wheeler, and myself (in my dissertation, *Prolegomena to an Edition of the Panegyricus Messalae*, etc., 8-10 [*THE CLASSICAL WEEKLY* 19.238-239]). The most important part of this chapter is the attempt to solve the still unsolved puzzle, i. e. the reasons which led to Ovid's exile. Professor Owen believes (8) that Augustus suspected some connection between the teachings of the poet as expounded in the *Ars Amatoria* and Julia's outrageous conduct. But this was ten years before the order of *relegatio* was issued. Why did Augustus wait so long? The answer (19) is that, though the *Ars* was the official reason for the poet's exile, it was not the only reason which prompted the Emperor to banish Ovid¹. Professor Owen tries to discover this specific reason; he rejects the theories of all scholars who seek the solution by connecting Ovid with Julia's adultery (20-26). "The source of Ovid's misfortune", he says (26), "must be sought elsewhere, and was probably political rather than domestic..." On page 31 he maintains that "...It seems, however, probable that his unknown action was political and gave offence to Livia and Tiberius...", especially since Ovid associated himself with the friends of Germanicus, whom Tiberius feared on account of his popularity (34); therefore Ovid ap-

²⁰²Published by Hermann Fries (Leipzig, 1864).

²⁰³Transactions of the American Philological Association 49.67-82. I regard Professor Tavenner's paper as a model treatment of this type of subject.

¹In my review of Professor Wheeler's version of the *Tristia* and the *Epistulae ex Ponto*, *THE CLASSICAL WEEKLY* 18.170, I set aside by side his discussion and Professor Owen's of the causes of Ovid's banishment. The book here under review appeared after Professor Wheeler's book was published. Professor Wheeler maintained (xxiii) that "Augustus's own attitude, as shown by Ovid, indicates that the poet's sin was not a very heavy one.... It is plain that Augustus and after his death Tiberius, who continued so religiously the policies of his predecessor, were quite satisfied merely to have Ovid out of the way..." C. K.>



Popular Methods of Measuring

Author(s): Eugene S. McCartney

Source: *The Classical Journal*, Vol. 22, No. 5 (Feb., 1927), pp. 325-344

Published by: [The Classical Association of the Middle West and South](#)

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POPULAR METHODS OF MEASURING

By EUGENE S. MCCARTNEY
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Standard units of counting and measuring, which are so essential to the complexities of civilized life, were looked upon by some of the Greeks as inventions. With the love of precise information characteristic of the mythologizing process, they created a number of more or less mythical Henry Fords to whom they ascribed the standardization.¹ These units are, however, the result not of invention but of evolution, and of extremely slow evolution. They originated from things in the natural world, which, even though they fall in the same category, vary in weight and size. Since seeds and other products of vegetation shrink, even a single specimen may vary in weight and size at different seasons of the year. It is obvious, therefore, that the standardizing of any unit of weight or capacity or space or time must have required a long period of experimentation and adaptation. Greek travelers upon the Nile were bewildered by the varying length of the *schoinos* as they passed from city to city.² Perhaps there was some opposition at first to the introduction of standard measures, for one man at least called upon the gods to destroy those who first divided the day into hours and substituted the sun-dial for "stomach" time.³

Vitruvius (iii. 1. 5) tells us what we already know, that the fundamental ideas of measures of length were derived from parts of the body, as the finger, the palm, the forearm (*cubitus*), the foot.⁴ Within four lines of Hesiod's *Works and Days* (423-

¹ See Sophocles *Frag.* 399 (Nauck²); Aristoxenus ap. Diog. Laertius 8. §14; Isid. *Orig.* xvi. 25.2; Pliny *Nat. Hist.* vii. 198. Cf. Eurip. *Phoen.* 541-542.

² Strabo xi. 11. 5; xvii. 1. 24. Cf. Pliny *Nat. Hist.* vi. 124.

³ Aquilius ap. Aul. Gell. *Noct. Att.* iii. 3. 5.

⁴ Even more parts of the body are mentioned by Hero Alex. *Geom.* p. 47. 4 (ed. Hultsch).

426) we find the poet urging his brother to make a pestle three cubits long, an axle seven or eight feet long, a fellow three spans across, and a wagon ten palms broad. To us this seems like a confusion of denominations, but it is noticeable that all these units are derived from parts of the body. Yes, man was the measure of all things. Perhaps in restricted areas, in days prior to great racial mixture, there may have been more uniformity in the size of members of the body.

The decimal system is a reminder that our ancestors once counted by fingers, as is the use of the word "digit" for a whole number. Our word "grain" as a unit of weight still shows that seeds were once employed in determining amounts. Measures of capacity were probably derived from such objects as the hands (i.e., hands full or handfuls), gourds, shells, baskets, or other receptacles in common use.

The history of our standard units of various kinds of measures has been the subject of careful investigation, and I intend to give it but scant attention, although it forms a fascinating chapter in the annals of civilization.⁵ Neither am I interested in such academic questions as the one propounded in the *Clouds* of Aristophanes (145): "How many feet of its own can a flea jump?" There have always existed, however, certain homely makeshift methods of measuring that never became standardized in formal tables. It is chiefly of these that I wish to speak. A recent number of *Life* (Nov. 19, 1925, p. 10) gives an exaggerated illustration of what I mean. To the question, "How long have

⁵ The Greek and Latin references and texts pertinent to the formal side of the subject have been collected by Fridericus Hultsch, *Metrologicorum Scriptorum Reliquiae*, 2 volumes, Teubner, 1864 and 1866. For a discussion of problems in connection with these passages, see the same author's *Griechische und Römische Metrologie*, second edition, Berlin, 1882. For a general discussion of the subject see Edward Nicholson, *Men and Measures, A History of Weights and Measures Ancient and Modern*, London, 1912. Much material is available in our general handbooks and dictionaries. Considerable material pertinent to a few paragraphs of my paper has been gathered together by W. Riepl in the third chapter of *Das Nachrichtenwesen des Altertums*, Leipzig-Berlin, 1913.

you had your maid?" the reply is given, "Three sets of summer dishes."

MEASURES OF DISTANCE

In the *Odyssey* the expression ὅσσον τε γέγωνε βοήσας, "as far as was one shouting," occurs not fewer than four times.⁶ This is our "shouting" or "hailing" distance, or, according to some sections of the country, "crying" distance. More picturesque is the phrase "within chasing and swearing," which appears in *Aglaura*, a comedy published in 1638 by Sir John Suckling. A man shouting lustily, μακρὰ βοῶν (*Iliad* ii. 224), could make his voice carry farther than the ordinary shouting distance of the *Odyssey*. I venture no comparison with "swearing" distance.

We too have found a method of differentiating between the distances the voice will carry. In *A Knight of the Cumberland* (chap. iv), by John Fox, Buck, a mountain lad, on being questioned how far it is to his home, replies: "Oh, 'bout one whoop an' a holler." The same expression is used in another one of Fox's books, *In Happy Valley* (chap. i).⁷ A friend tells me that he has heard it in Connecticut. A recent number of the *Atlantic Monthly* (Oct., 1925, p. 473) says: "She lives about two-whoops-and-a-holler up Troublesome."

"As far as one looks" occurs in the *Iliad* (iii. 12). Pliny (*Nat. Hist.* iv. 31) tells us that in the vale of Tempe the mountains rise to right and left "beyond a man's gaze" (*ultra visum hominis*).⁸ The steeds of the gods leap as far as a man sitting upon a height can look out over the wine-colored sea.⁹ Two former students of mine who were hiking in Maryland were informed that their destination was "a look or two" farther on. Another friend, who, while traveling in the South, heard "two looks and a half," explains that it is an expression adapted to a rolling country. Still another friend has heard "two sights and a look and a right

⁶ v. 400; vi. 294; ix. 473; xii. 181: cf. *Iliad* xii. 337.

⁷ "Beyond the vine-clad bluff and 'a whoop and a holler' farther on was Home." — Page 15 of the 1917 edition.

⁸ Cicero (ap. Plin. *Nat. Hist.* vii. 85) mentions the case of a man who could see 135 miles.

⁹ *Iliad* v. 770-772.

smart get." A modern military measure of optical distance is: "Don't fire until you can see the whites of their eyes."

There are many methods of indicating the distance traveled. The most obvious is the day's journey¹⁰ or the day's sail.¹¹ So common was it to travel the entire period of daylight that Aeschylus has a verb "to day it."¹² The land of the Illyrians was said to be five days' journey in breadth and thirty in length.¹³ The distance from Sardis to the so-called palace of Memnon was 13,500 stades, according to Herodotus (v. 53). He adds that those traveling 150 stades a day could make it in 90 days. If we estimate a stade at 606¾ English feet, the traveler covered almost 17¼ miles a day. In view of the length and conditions of the journey, this, it seems to me, is a very respectable distance. Greeks going such a distance would have to carry some baggage and, if they were like Americans, would be encumbered by many useless souvenirs on the return trip.

The length of the coast line of India was measured as a sail of forty days and forty nights.¹⁴ Thucydides (vi. 1. 1) knew of no better way to indicate the size of Sicily than to say that it took a merchantman not much less than eight days to circumnavigate it. The distance traveled naturally varied according to the character of the land or of the sea.¹⁵ Of course the length of a day's journey by land would in many cases depend on the possibilities of accommodation, but inns doubtless sprang up at convenient distances wherever travel was common.

On the famous trip from Rome to Brundisium Horace's party divided into two parts the journey from Rome to Forum Appi,¹⁶

¹⁰ E.g., Herod. i. 206; iv. 101 (see Stein's note *ad loc.*); Theophr. *Hist. Plant.* iv. 4. 1; Strabo vii. 5. 11; xvi. 1. 27; xvi. 4. 21; xvii. 1. 45; xvii. 3. 19; Pliny *Nat. Hist.* v. 34 (*bis*); v. 38; vi. 52; vii. 12. Cf. Riepl, *op. cit.*, pp. 137-147.

¹¹ E.g., Herod. iv. 86; Strabo i. 4. 2; x. 4. 5; xi. 2. 17; xv. 1. 15; xvi. 3. 4; Pliny *Nat. Hist.* iv. 94; iv. 104 (*bis*); vi. 86. Cf. Riepl, *op. cit.*, pp. 157-171.

¹² ἡμερεύειν, *Choeph.* 710.

¹³ Appian *Illyr.* i. 1.

¹⁴ Pliny *Nat. Hist.* vi. 57.

¹⁵ See, for instance, Rawlinson on Herodotus i. 72.

¹⁶ Horace *Sat.* i. 5. 5-6.

a distance of some forty English miles.¹⁷ The poet says that this was one day's journey for those who were "girded higher," *altius praecincti*. The Latin is merely an equivalent of a common Greek expression, εὐζώνως ἀνήρ.¹⁸ Hesychius defines εὐζώνως as εὐστόλως, μὴ ἔχων φορτίον, which is a natural secondary use of the word. Herodotus (i. 104) tells us that for a well-girded man it was a journey of thirty days from the marsh of the Maeotis to the river Phasis and the Colchians.

Perhaps our best standard of the distance a well-girded man could travel in one day under ideal conditions is given by Procopius.¹⁹ He says that from Rome to Capua by the Appian Way is a journey of five days for such a traveler. The distance is estimated by one of our editors as 132 Roman miles. According to Procopius, then, a well-girded man traveled about 26 miles a day.

In Persia the stations where a king rested were called "stands" or "stopping places," σταθμοί in Greek, and hence the word came to denote stages, a day's journey or a day's march.²⁰ In making a treaty with the king of Persia Cimon stipulated that the Persian should come no nearer to the Greek seacoast than a horse could travel in a day.²¹ Because of the magnitude of his empire Cyrus wished to find a ready means of communication. "He experimented to find out how great a distance a horse could cover in a day when ridden hard but so as not to break down, and then he erected post-stations at just such distances and equipped them with horses and men to take care of them."²²

The Roman army measured distances by "camps," since it made a new camp every day while on the march. Hence we find such

¹⁷ "Nearly forty English miles" — E. P. Morris; or, forty-three Roman miles.

¹⁸ Herod. i. 72; i. 104; ii. 34. 2; Thuc. ii. 97; Strabo vi. 3. 5; xvi. 4. 8. The frequency with which the expression occurs in Greek does not seem to be generally known to editors of Horace.

¹⁹ *De Bell. Goth.* i. 14.

²⁰ Liddell and Scott, *s.v.* σταθμός. See Herod. v. 52-53.

²¹ Plut. *Cimon* 13. 4. See Perrin's translation. Another example is to be found in Cassius Dio. i. 9. 5.

²² Xen. *Cyrop.* viii. 6. 17 (W. Miller's translation). Cf. Riepl, *op. cit.*, pp. 147-151; 188-196.

expressions as "On the tenth camp he arrived at the Ebro."²³ Legionary soldiers using the "military" step could make twenty miles in five "summer" hours; with the "full" step, which was quicker, twenty-four miles in the same time.²⁴ I have no statistics for the "goose" step.

The "Sabbath day's journey" of the Bible (e.g., Acts 1:12) had no definite natural limits, but the rabbis restricted it to 2000 cubits.²⁵ I am told that in some of our southern states the distances between places are now estimated by stils.

Such methods of measuring distance seem at first incapable of standardization, yet they might have become very definite. The stadion, "stopping," was originally the distance that a strong man could run without getting out of breath, yet the Olympic stadion was standardized as 600 feet.²⁶ The furlong is etymologically a "furrow long." According to Columella,²⁷ "To draw a furrow longer than 120 feet is a strain upon an animal, since it is unduly fatigued when it exceeds this limit."

As one might expect, the distances to which various kinds of missiles could be thrown served as standards of measure. "A stone's throw"²⁸ and "a quoit's cast"²⁹ must have been common. The range of various missiles and projectiles has been used frequently as a standard ever since they were first employed. In the funeral games in honor of Patroclus the chariot of Meriones comes in a javelin's cast behind that of Menelaus.³⁰ "Out of range of missiles" and "within range of missiles" were expressions in frequent use to measure the distance between combatants.³¹ At Issus Alexander's men delayed running until they were within

²³ Livy xxviii. 33. 1. For other examples see Livy xxvii. 32. 11; xxviii. 19. 4; xl. 22. 1; Caes. *B.G.* vii. 36. 1; Curtius viii. 12. 4.

²⁴ Veg. *Epit. Rei Militaris* i. 9. Cf. Riepl, *op. cit.*, pp. 129-136.

²⁵ *The New Schaff-Herzog Encyclopedia*, s.v. "Weights and Measures," p. 289.

²⁶ See Hultsch, *Griechische und Römische Metrologie*, p. 33.

²⁷ *Res Rust.* ii. 2. 27; see also Pliny *Nat. Hist.* xviii. 9.

²⁸ λίθου βολή, Thuc. v. 65. Cf. ὅσον τ' ἐπὶ λαῶν ἦσαν, *Iliad* iii. 12.

²⁹ δίσκουρα, *Iliad* xxiii. 523; δίσκων οὖρα, *Iliad* xxiii. 431.

³⁰ *Iliad* xxiii. 529. Cf. xv. 358; xxi. 251.

³¹ See Liddell and Scott, s.v. βέλος.

reach of darts.³² Naturally "a spear's range" is found.³³ Marius started battle against the Teutones when they came within range of the pila.³⁴ "As far as a Balearic sling could reach," is the expression Ovid uses to indicate the distance of the sea-monster from Andromeda when Perseus assailed it.³⁵ To list such expressions through the ages would be equivalent to tracing the development of ballistics.

For *recta via*, a prosaic Roman expression to indicate a straight line, we have the picturesque "bee-line," "as the crow flies," "in an air-line."

There are homely ways of measuring breadth as well as length. A striking statement is made of the Appian Way by Procopius.³⁶ Two wagons could pass upon it! No wonder it was the *regina viarum*. According to Strabo,³⁷ the walls of Babylon were broad enough to permit four-horse chariots to pass with ease. Procopius and Strabo are, however, but humble forerunners of modern statisticians whose imaginary trains of commodities stretch across the continent or belt the earth or reach even to Mars.

To Horatius Cocles a grateful Republic gave as much land as he could plow in a day.³⁸ In the words of Macaulay,³⁹

They gave him of the corn-land,
That was of public right,
As much as two strong oxen
Could plow from morn till night.

Stories of measuring land by a bull's hide are widespread.⁴⁰

³² Arrian *Anab.* ii. 10. 3.

³³ ἀκοντίου βολή, Thuc. v. 65; δουρηνέες, *Iliad* x. 357.

³⁴ Plut. *Mar.* xx. 5-6.

³⁵ *Met.* iv. 709-710.

³⁶ *De Bello Goth.* i. 14. Diodorus ii. 7. 4 says the same thing. Herodotus i. 179 states that a four-horse chariot might drive between the towers.

³⁷ xvi. 1. 5.

³⁸ Livy 2. 10. 12. Extremely interesting in this connection is an article by William Ridgeway, "The Homeric Land System," *Journal of Hellenic Studies*, 6. 319-339.

³⁹ *Horatius*, Stanza lxxv.

⁴⁰ Frazer, "Hide-Measured Lands," *The Classical Review*, ii. 322; Frazer, *Adonis, Attis, Osiris*, 2, 250. See also an article by B. Laufer, *Smithsonian*

The one in the *Aeneid* (i. 367-368) is familiar to all. In his comment on Vergil, Servius says that the hide which Dido's followers cut into strips covered twenty-two stadia. A story similar to that of the founding of Carthage is told in connection with the early history of New York. It occurs in a manuscript in the library of the New York Historical Society.⁴¹ It is a letter written by John Heckewelder in 1801. The following account of a transaction between the Indians and the Dutch was related to him forty years earlier by an aged and respected Indian:

Familiarity daily increasing between them & the Whites, the latter now proposed to stay with them, asking them only for so much Land as the Hide of a Bullock would cover (or encompass) which Hide was brought forward and spread on the Ground before them. — That they readily granted this request; whereupon the Whites took a Knife & beginning at one place on this Hide, cut it up, to a Rope not thicker than the finger of a little Child; so that, by the time this Hide was cut up there was a great heap. — That this Rope was drawn out to a great distance & then brought round again so that both ends might meet. — That they carefully avoided its breaking, & that upon the whole it encompassed a large piece of Ground — That they | : the Inds. | were surprised at the superior wits of the Whites, but did not wish to contend with them about a little Land, as they had enough.

This story caused Washington Irving to invent one of his own. He says that the Dutch bargained for as much land as a man's nether garments could cover, and that the Indians were surprised when they saw Mynheer Ten Broeck peel off breeches after breeches, much in the manner of an onion.

Herodotus (iv. 7) tells how under certain conditions the Scythians used to give to one of their number as much land as he could ride around in one day on horseback. Modern history provides an authentic instance of the acquisition of land by walking around it. In discussing the encroachments of the whites upon the lands

Miscellaneous Collections, I, (1908), 282-284, for references to Asiatic versions of the Dido story, in which Europeans play the rôle of deceiver.

⁴¹ *Miller Papers*, Vol. I, document 62 (numbered lightly in pencil).

of the Indians in Pennsylvania, Parkman, *The Conspiracy of Pontiac* (I, 84, 10th edition), writes:

The most notorious of these transactions, and the one most lamentable in its results, was commenced in the year 1737, and was known by the name of the *walking purchase*. An old forgotten deed was raked out of the dust of the previous century; a deed which was in itself of doubtful validity, and which had been virtually cancelled by a subsequent agreement. On this rotten title the proprietors laid claim to a valuable tract of land on the right bank of the Delaware. Its western boundary was to be defined by a line drawn from a certain point on Neshaminy Creek, in a northwesterly direction, as far as a man could walk in a day and a half.

There was even more trickery in the execution of this agreement than in that at Carthage.

MEASURES OF TIME

The ancients used the water-clock and sun-dial as means of marking off divisions of time. The hour-glass, too, is a rather makeshift way of measuring. The "pipe" of tobacco is an interesting parallel, although it is employed in measuring distance as well as time. As a boy I read a South American story which represented Indians as measuring distance by the time it took to smoke a pipe-load of tobacco. In *Immensee* one finds the expression *Keine halbe Pfeif' Tobak* to indicate distance.

Washington Irving's *Knickerbocker History of New York* represents the Dutch as indicating both time and distance by "pipes." He tells of one meeting which lasted twelve "pipes" (Book II, chap. viii). From another passage (Book III, chap. ix) we learn that two hundred "pipes" equal about one hundred and twenty miles. A friend who was born and reared in Holland informs me that he has heard this use on the canals⁴² to indicate distance, but not time.

A sentence in Varro's *Lingua Latina* (vi. 11) is "interesting if true": *Seclum spatium annorum centum vocarunt, dictum a*

⁴² Cf. Mary Mapes Dodge, *Hans Brinker or The Silver Skates* (chap. xx): "How far are we from Leyden, Schipper?" "Not more'n a couple of pipes."

*sene, quod longissimum spatium senescendorum hominum id putarunt.*⁴³

There are numerous ways to indicate a very short period of time. St. Basil's ῥιπή ὀφθαλμῶν⁴⁴ reminds one of the biblical "twinkling of an eye."⁴⁵ Compare "ein Augenblick" and "as quick as a wink." We say also "as long as it takes to say Jack Robinson," "in three shakes of a dog's tail," "in the flicker of a lamb's tail."⁴⁶

Some striking methods of setting a time-limit may be noted. Caesar grants the Atuatuci the privilege of surrendering any time before the battering-ram touches the wall of their stronghold.⁴⁷ Somewhat similar is the period of grace granted to a sinner: "There is . . . a kind of Excommunication by Inch of Candle; wherein the time a lighted candle continues burning is allowed the sinner to come to repentance; but after which, he remains excommunicated to all intents and purposes."⁴⁸ Goods used to be auctioned by inch of candle. The last bidder before the candle went out secured the article.⁴⁹

There were many towns which were impregnable until their talismans were captured or until certain conditions were fulfilled. Troy, for example, could not be taken until the Palladium was lost.⁵⁰ Troy *could* be taken only until the horses of Rhesus should crop the grass on the plains of Troy and drink of the waters of the Xanthus.⁵¹ Examples of similar things are numerous.⁵²

Many ways of saying "seldom," "never," and "forever" might

⁴³ On the varying meanings attached to γεveά and *sacculum* see an article by myself, "Longevity and Rejuvenation in Greek and Roman Folklore," *Papers of the Michigan Academy of Science, Arts and Letters*, V, 64-65.

⁴⁴ Migne, *Patrologia Graeca*, 29, col. 128.

⁴⁵ I Corinthians 15: 52.

⁴⁶ See Alfred Henry Lewis, *Faro Nell and Her Friends (Wolfville Stories)*, p. 51, for the last expression.

⁴⁷ Caes. *B.G.* ii. 32. 1-2.

⁴⁸ *New English Dictionary*, s. v. candle (quoting *Chambers' Cycl.*).

⁴⁹ *Ibid.*

⁵⁰ Verg. *Aen.* ii. 165 calls it *fatale* because the fate of Troy was bound up with it.

⁵¹ *Ibid.*, i. 473-474.

⁵² See Frazer's *Pausanias* iv. 433-434 for numerous illustrations.

be found. Some of them are oracular, others semi-proverbial or proverbial, and still others poetic. "Until (when) a mule shall bring forth," is a common way of saying "seldom"⁵³ or "never."⁵⁴ "Until ravens become white"⁵⁵ has a proverbial ring. An epigram in the *Greek Anthology* (xi. 436) says: "You will more quickly find white crows and winged tortoises than a Cappadocian who is an accomplished orator." An ambassador retorts to the domineering Crassus: "Hair will grow here [on the palm of my hand] before you shall see Seleucia."⁵⁶ Still other impossible reversals of the order of nature are frequently mentioned, e.g., "For the mountains will be without the shade-bearing tree and the seas without sail-clad ships and rivers in backward course will return to their fountains before my gratitude for thy services can cease."⁵⁷

To indicate the idea of perpetuity an appeal is frequently made to things in nature which are immutable in their characteristics.⁵⁸ Perhaps the best-known example is that in Vergil's *Aeneid* (i. 607-610): "As long as rivers shall run into the sea, as long as shadows shall course over the mountains, as long as the heavens shall feed the stars, so long shall thy honor and thy name and thy praises endure what lands soever shall summon me."

A parallel to the oracular utterance of antiquity in which the prophecy is interpreted to mean "never" is seen in Macbeth's ". . . until Great Birnam wood to high Dunsinane shall come."⁵⁹ In Scott's *Lay of the Last Minstrel* (l. 18) we find: "Your mountains shall bend and your streams ascend, Ere Mar-

⁵³ Saepius enim mulam peperisse arbitror quam sapientem fuisse, Cicero *De Div.* ii. 61.

⁵⁴ ἕως ἡμέρας ἰούλοναι τέκωσι, Herod. iii. 151; cum mula pepererit, Suet. *Galba* 4; Otto, *Die Sprichwörter der Römer*, p. 232, No. 1162.

⁵⁵ Athenaeus viii. 360 e-f.

⁵⁶ Appian (?) *Parthica* 35.

⁵⁷ Ovid *Ex Pont.* iv. 5. 41-44. For many similar references, see K. F. Smith, *The Elegies of Tibullus*, p. 284.

⁵⁸ See Smith, *op. cit.*, pp. 283-284; Shorey-Laing edition of Horace, *Odes and Epodes*, pp. 222-223. See also Sandys, *A History of Classical Scholarship*, 2d ed., I, 230; *Anthol. Pal.* ix. 821. 2; Horace *Epodes* xv. 7-10.

⁵⁹ *Macbeth*, 4, 1, 93. See also 5, 3, 60; 5, 5, 44; 5, 8, 30.

garet be our foeman's bride." ⁶⁰ "Till the cows come home," is a popular way of saying "never." Some of my own extravagant boyish requests were parried by "Wait till my ship comes in."

"Till kingdom come" means "forever." "While wood grows and water runs" is a condition frequently found in old deeds. More elaborate is Bayard Taylor's "Till the sun grows cold, And the stars are old, And the leaves of the Judgment Book unfold." ⁶¹

MEASURES OF WEIGHT AND CAPACITY

There were various ways of measuring stones. In the *Iliad* ⁶² both Diomedes and Aeneas throw stones which two ordinary men of Homer's day could not carry. Vergil ⁶³ says that twelve men could not lift the stone thrown by Turnus. Barbarians rolled down upon Xenophon's men stones large enough to make a wagon-load. ⁶⁴ From the *Anabasis* (iii. 3. 17) we learn likewise that the Persian slings carried but a short distance because their stones were big enough to fill the hand. A more curious way of measuring a stone is recorded in Plato's *Laws* (xii. 958) in connection with his words about funeral pyres. He says: "And let not the mound be piled higher than would be the work of five men completed in five days; nor shall the stone which is placed over the spot be larger than would be sufficient to receive the praises of the dead in four heroic lines." ⁶⁵

Among the Romans the scruple or pebble finally became standardized as the smallest unit of weight, the twenty-fourth part of an ounce. ⁶⁶ In England a person's weight is given as so many stone, but in popular usage "a stone may be equivalent to any weight from 8 lb. to 24 lb., it would depend whether the article

⁶⁰ Cf. Tennyson, *Will Waterproof's Lyrical Monologue*, 35-36, "Against its fountain upward runs The current of my days." For other parallels see K. F. Smith, *The Elegies of Tibullus*, p. 284.

⁶¹ *Bedouin Song*.

⁶² v. 303; xx. 285-287.

⁶³ *Aeneid* xii. 899.

⁶⁴ ἄμαξιοι, *Anab.* iv. 2. 3. Cf. δέκα ἄμαξα πετρῶν, iv. 7. 10.

⁶⁵ Jowett's translation, Vol. V, p. 348.

⁶⁶ For this and other uses see Harpers' *Latin Dictionary*, s.v. *scrupulus*.

in the scales was beef, or butter, or hay, or wool, and so on.”⁶⁷ The stone has experienced more difficulty in becoming standardized than has the power of a horse (horse-power).

The origin of *cochlear* as a measure would seem to be obvious from its derivation. Originally the *cyathus* may have been a kind of gourd.⁶⁸ In the early days of exploration in the western part of our country the Spaniards stored gold dust in quills and hence “quill” became a unit of measure.

Grains and seeds of various kinds have played an important part in the development of our measures. A valuable reference in this connection is Sir William Ridgeway’s *The Origin of Metallic Currency and Weight Standards*.⁶⁹

An interesting passage on measures occurs in Isidore’s *Origines* (xvi. 26. 17): *Cora enim hebraice colles appellantur. Coacervati enim modii XXX instar collis videntur et onus cameli efficiunt.*

An endless amount of goods and gear on a certain Phoenician ship was packed away so neatly that it occupied only as much space as a room capable of holding ten couches.⁷⁰ We hear also of caldrons larger than cisterns or reservoirs big enough for twelve couches.⁷¹

In *Moby Dick, or the White Whale* (chap. cii) Herman Melville estimates that a sperm whale between eighty-five and ninety feet long “would considerably outweigh the combined population of a whole village of one thousand one hundred inhabitants.”

MISCELLANEOUS

At Memphis and on the island of Elephantine in the Nile were “Niloscopes” or “Nilometers,” which were wells lined with stones on which had been recorded the low, mean, and high risings of the river. In them the water rose with that of the river.

⁶⁷ E. M. Wright, *Rustic Speech and Folk-Lore*, p. 329. See also Nicholson, *Men and Measures*, p. 107.

⁶⁸ Smith, *Dictionary of Greek and Roman Antiquities*, s.v. *Mensura*, p. 164.

⁶⁹ Especially chap. viii: “How Were Primitive Weight Units Fixed?”

⁷⁰ Xen. *Oec.* viii. 13.

⁷¹ Athen. iv. 131B.

By the aid of marks on the stones experienced observers could tell in advance how much the river was going to rise.⁷²

In 1916 I saw at Tarracina paper cones dangling from the signs of wine-shops. Inquiry elicited the information that white cones indicated *vino bianco*, "white wine," while red ones meant *vino rosso*, "red wine." Their number indicated the price per half-liter.

The most intimate friendships were formed only after persons had eaten "bushels of salt" together. *Multi modii salis simul edendi sunt ut amicitiae munus expletum sit.*⁷³

What is the measure of a married man? The Getae are said to have had ten or eleven or even more wives. If a man had only four or five, he was accounted unmarried.⁷⁴

In *Campaspe* (2, 2, 121) Lyly puts the following dialogue into the mouths of Alexander and Diogenes: *Alexander*. "How happened it that you would not come out of your tub to my palace?" *Diogenes*. "Because it was as far from my tub to your palace as from your palace to my tub."⁷⁵

PARTS OF THE BODY AS UNITS OF MEASURE

I have hitherto excluded from consideration measures which finally found their way into formal tables and became definite units with specific relations to other units. Several parts of the body, such as the finger, palm, forearm (*cubitus*, πῆχυς), and foot, finally became precise units of length,⁷⁶ but the transition was so gradual and some of the uses are so far afield from our own that the reader of the classics does not always realize that he is dealing

⁷² Diodorus i. 36. 11-12; Strabo xvii. 1. 48. Murray's *Handbook for Travellers in Egypt* (1875), pp. 170-172 is interesting on the subject of the Nilometer.

⁷³ The original of the Latin is found in indirect discourse in Cicero *Lael.* 19. 67. See Otto, *Die Sprichwörter der Römer*, pp. 19-20, No. 86.

⁷⁴ Strabo vii. 3. 4.

⁷⁵ This seems to be an elaboration of a story told by Plut. *Alex.* 14. At the 1924 meeting of the American Philological Association in Chicago the observation was made that it is "farther from New York to Chicago than from Chicago to New York."

⁷⁶ See a long passage in Pollux ii. 157-158.

with formal units. In closing I wish to give a few illustrations of "anatomical" measurements, both formal and popular, and to add a few homely parallels.

The ancients employed as a basis of measurement many parts of the hand and arm, from the finger nail to the outstretched arms. "Nail's breadth" or simply "nail" became proverbial for "a short distance," e.g., *a recta conscientia transversum unguem non oportet discedere*;⁷⁷ *nec eum . . . ungue latius a se discedere passa est*.⁷⁸ Similar is the "finger's breadth" or simply the "finger," e.g., *Si hercle tu ex istoc loco digitum transvorsum aut unguem latum excesseris*;⁷⁹ *digitum progredi non possunt*.⁸⁰ We speak of a "hairbreadth" escape, of escaping "by the skin of the teeth,"⁸¹ of a horse's winning a race "by an eyelash," or, non-figuratively perhaps, "by a neck."

The breadth of the finger (i.e., the middle finger) is in frequent use as a unit of measure. Lucretius (iv. 414) speaks of water not more than one finger deep. Cyrus hit Artaxerxes so hard a blow with his spear that it pierced his armor and penetrated his flesh two fingers deep.⁸² On learning that the planking of a ship at sea was four fingers thick Anacharsis said that those sailing in it were four fingers from death.⁸³ Strabo (xv. 1. 21) speaks of pods ten fingers long. The *Geoponica*⁸⁴ tells the farmer to plant seeds so many fingers deep and so many fingers apart.

Four fingers make a palm; sixteen a foot. Since these higher units existed, one is surprised to find a dimension given as fifty

⁷⁷ Cicero *Ad Att.* xiii. 20. 4. Cf. Cicero *Ad Fam.* vii. 25. 2; *idem*, *Acad.* ii. 58; Hieronym. *Ep.* 107. 9; 120. 10; 123. 3; 127. 8; *idem*, *Comment. in Joel.* (Migne, *Patrol. Lat.*, 25, col. 964).

⁷⁸ Apul. *Met.* x. 26. Cf. *ibid.*, ii. 18; xi. 17.

⁷⁹ Plaut. *Aul.* 57.

⁸⁰ Cicero *Acad.* ii. 116. Cf. Plaut. *Bacch.* 423; Cicero *Ad Att.* vii. 3. 11; *idem*, *In Verr.* iv. 15. 33.

⁸¹ There is a different preposition in Job 19:20: ". . . and I am escaped with the skin of my teeth."

⁸² Plut. *Artaxerxes* 11.

⁸³ Diogenes Laertius *Life of Anacharsis* i. §103.

⁸⁴ For such operations see xi. 18. 2, 5, 14 *et passim*, and also Palladius, iv. 1. 2; iv. 7. 2; viii. 1. 3.

fingers.⁸⁵ Reference to the dictionaries will show that the finger is still a unit of measurement in the United States. As a boy I have seen the charges in old-style shot-guns estimated by fingers. "Three fingers" is (or was) a standard way of measuring drinks. The amount of other liquids in a glass may be measured by fingers.

The thumb must be discussed apart from the fingers. The nails used in the ships of the Veneti were as thick as the thumb.⁸⁶ Cato⁸⁷ advises the farmer to make solid *cunicae* a thumb thick.

The Latin *uncia* means "thumb-nail breadth," which was equal to *digitus*. "When the Romans adopted the duodecimal or 'uncial' system, they applied it to the foot, which was divided into either 12 or 16 parts, both called *unciae*; but to distinguish these they used two words, *digitus* for the sixteenth and *pollex*, thumb, for the twelfth, the thumb-breadth."⁸⁸ The word *uncia* became "inch" in English after various intermediate changes.

Brewer⁸⁹ says that "countrymen always measure by their thumb." The expression "by rule of thumb" is believed to be a relic of the old custom of measuring material by the length of the thumb. In Dutch the word *duim* does duty for both "thumb" and "inch."

In England the word "nail" was used for the thumb-nail breadth and equalled one-sixteenth of a foot.⁹⁰ This will be found to be exactly the breadth of the thumb nails of a large number of one's masculine friends. The word "nail" was applied also to the sixteenth of a hundred-weight. In rendering "nail" into Latin

⁸⁵ Vitruvius viii. 6. 4.

⁸⁶ Caesar *B.G.* iii. 13. 4.

⁸⁷ *De Agri Cultura* 20. Cf. Theophr. *Hist. Plant.* iv. 8. 5; iv. 8. 7. In iv. 8. 3 Theophrastus compares the thickness of the root of papyrus to that of the wrist of a stalwart man. Strabo xvii. 3. 11 compares the thickness of straw to that of the little finger.

⁸⁸ Nicholson, *op. cit.*, 243.

⁸⁹ *A Dictionary of Phrase and Fable* (1905), *s.v.* thumb.

⁹⁰ Nicholson, *op. cit.*, 244. *The New English Dictionary* notes the use of "nail" as one-sixteenth of a yard and says: "The precise origin of this sense is not clear. The use of the *nail* in early examples suggests that one sixteenth from the end of the yard-stick may have been marked by a nail."

the scribes of Plantagenet times mistakenly used *clavus*, a carpenter's nail, instead of *unguis*. "But *clavus*, a nail, became confounded with *clavis*, a key, and so in Southern France the nail-weight, introduced from England, became *clau*, a key, instead of *clavèu*, a nail."⁹¹

The palm is naturally four fingers wide. The *Geoponica* (xi. 18. 2) tells us that roses are to be pruned when they are a palm or four fingers from the ground. The palm (or hand) is still used in measuring the height of horses.

The distance between the outstretched thumb and forefinger (λιχανός) is called by the Greeks λίχας, "the lesser span," while the normal span, σπιθαμή, is the distance between the outstretched thumb and little fingers.⁹² A race of dwarfs beyond India was called Trispathami, "Three-spanners."⁹³ The span too is still used in measuring the height of a horse.

From the end of the outstretched middle finger to the elbow is the cubit or ell. I am told that in country stores in Holland ribbon is still measured in this way. The word "alnage" is of course a reminiscence of "elbow" measurement. In some of the early transactions of the Dutch with the Indians around New Amsterdam the hand or hand-length was a unit of length.

With the fingers doubled over, the distance to the elbow is a πυγών, i.e., twenty fingers. When they are closed, making a fist, the distance from the knuckles is a πυγμή, or eighteen fingers. When both hands are outstretched in opposite directions we have the ὀργυιά (ulna)⁹⁴ the "reach" or fathom.⁹⁵ Pliny⁹⁶ says that this distance should be the height of a man. Timbers cut for a large ship for Demetrius were thirteen "reaches" long.⁹⁷ It seems

⁹¹ Nicholson, *op. cit.*, 245.

⁹² Pollux ii. 157-158.

⁹³ Pliny *Nat. Hist.* vii. 26.

⁹⁴ In Pliny *Nat. Hist.* xvi. 133, 202, the word *ulna* seems to be so used, but in general the meaning of this word is not clear. In some instances it is obvious that the word does not mean six feet.

⁹⁵ Pollux ii. 158.

⁹⁶ *Nat. Hist.* vii. 77. Cf. Vitruvius iii. 1. 3.

⁹⁷ Theophr. *Hist. Plant.* v. 8. 1.

rather strange to us to find long distances estimated in this denomination, as when Herodotus (iv. 86) speaks of a voyage of sixty or seventy thousand "reaches." I have seen women measure cloth by using as a unit the distance from the nose to the end of the outstretched arm.

There are certain measures of capacity derived from the fingers and arms. "As much as you can grasp with three fingers" ⁹⁸ is one way of measuring seed. We use "pinches" of snuff or salt. A *manipulus* is as much as will fill a hand, according to Isidore.⁹⁹ Liddell and Scott say that δραχμή means as much as one can hold in the hand.¹⁰⁰ "Handful" is common today.

Another form of measurement is the *complexus*, "embrace," which is evidently only another form of *ulna* (in the sense of fathom), but is more picturesque as applied to round things. Pliny¹⁰¹ speaks of a tree *crassitudinis ad trium hominum complexum*, while Strabo tells of grapevine stems which required two men to girth them.¹⁰² Theophrastus¹⁰³ knew of a tree so large that four men would not easily have encircled it.

In Latin the word for foot became proverbial for a small distance, e.g., *neque pede, quod aiunt, uno a parente discessi*.¹⁰⁴ We use "step" also in this sense;¹⁰⁵ the Italian says *due passi*. The stadion was six hundred feet, but the stadium at Olympia was longer than others because (*ne crede fabulae*) it was marked off by the feet of Heracles, who was larger than ordinary men.¹⁰⁶

⁹⁸ Palladius iv. 9. 11; v. 3. 2.

⁹⁹ *Origines* xviii. 3. 11.

¹⁰⁰ Cf. δέσμαι, "bundles," Theophr. *Hist. Plant.* ix. 17. 1.

¹⁰¹ *Nat. Hist.* xvi. 203. In 202, however, he says, *arboris eius crassitudinis quattuor hominum ulnas complectentium implebat*.

¹⁰² xi. 10. 2; xvii. 3. 4.

¹⁰³ *Hist. Plant* iv. 16. 3.

¹⁰⁴ Quint. *Declam.* vi. 14. See Otto, *op. cit.*, p. 275, Nos. 1399, 1402.

¹⁰⁵ Cf. "At Old Christmas the days are longer by a cock's stride," E. S. Hartland, *County Folk-Lore* (Publications of the Folk-Lore Society, Vol. 37), p. 165.

¹⁰⁶ Aul. Gell. *Noct. Att.* i. 1. See Hultsch, *Griechische und Römische Metrologie*, p. 33, and William Ridgeway, "Metrological Notes, 1. The Origin of the Stadion," *Journal of Hellenic Studies*, 9, 18-28.

Many of the Indian banyan trees were forty paces through, while some of them were sixty.¹⁰⁷

Boys playing games still mark off distances with their feet. Men fighting duels used to be instructed to walk so many paces before turning and firing. I have seen farmers "step off" distances and depend upon their results in estimating the acreage to be devoted to certain crops. In football, penalties are always "stepped off."

Although popular usage established many definite relationships between the various parts of the human measuring-rod, artists carried the tendency still farther. An interesting passage in this connection is Vitruvius (iii. 1. 2) :

For the human body is so designed by nature that the face, from the chin to the top of the forehead and the lowest roots of the hair, is a tenth part of the whole height; the open hand from the wrist to the tip of the middle finger is just the same; the head from the chin to the crown is an eighth, and with the neck and shoulder from the top of the breast to the lowest roots of the hair is a sixth; from the middle of the breast to the summit of the crown is a fourth. If we take the height of the face itself, the distance from the bottom of the chin to the under side of the nostrils is one third of it; the nose from the under side of the nostrils to a line between the eyebrows is the same; from there to the lowest roots of the hair is also a third, comprising the forehead. The length of the foot is one sixth of the height of the body; of the forearm, one fourth; and the breadth of the breast is also one fourth. The other members too have their own symmetrical proportions, and it was by employing them that the famous painters and sculptors¹⁰⁸ of antiquity attained to great and endless renown.¹⁰⁹

This paper, though obviously fragmentary in character, is ample for my purpose. The present generation is interested in origins. It has been my desire merely to try to re-create some of the atmosphere in which tables of measures were formulated, since their

¹⁰⁷ Theophr. *Hist. Plant.* iv. 4. 4.

¹⁰⁸ On the canon of Polyclitus see Galen *De Hippocratis et Platonis Placitis* iv. 3. (Ed. Kühn, v. 449).

¹⁰⁹ M. H. Morgan's translation.

units must have passed through an experience somewhat similar to the popular measures I have mentioned. When we speak of a "hairbreadth" escape,¹¹⁰ we would never dream that "hairbreadth" might become a unit of measure, yet it long ago became such, for —

12 hairbreadths	=	1 poppy seed
4 poppy seeds	=	1 barley corn
3 barley corns	=	1 inch
4 inches	=	1 hand
3 hands	=	1 foot ¹¹¹

A paragraph from E. M. Wright's *Rustic Speech and Folk-Lore* (p. 328), which depicts conditions in England, will help us to understand the difficulties of the ancients in establishing definite units:

A catalogue of the weights and measures in the dialects does however upset a great many of our everyday ideas, and make our knowledge of Tables seem surprisingly limited. For here we find familiar measures changing their standard value according to locality, or according to the commodity to be sold by measure or weight; all sorts of new measures with queer names enter into computations where we had hitherto only dealt with plain bushels, or pounds, or inches. Liquid measures usurp the place of dry, and vice versa; and indefinite terms like heap, bunch, bundle become fixed quantities.

It is impossible to uproot all local customs and to establish uniformity. The situation would have been far more difficult to control in antiquity when means of travel and communication were fewer and when states and nations were far more numerous and smaller.

Incidentally this paper may have some historical interest, since many of the methods mentioned were local and ephemeral and have dropped out of use in civilized communities because of changing conditions.

¹¹⁰ Cf. Judges 20: 16: "Every one could sling stones at a hairbreadth and not miss."

¹¹¹ Nicholson, *op. cit.*, p. 61. Webster says that the hairbreadth is sometimes definitely called the forty-eighth part of an inch. In this table it is the one one-hundred-and-forty-fourth part.



Clouds, Rainbows, Weather Galls, Comets, and Earthquakes as Weather Prophets in Greek and Latin Writers

Author(s): Eugene S. McCartney

Reviewed work(s):

Source: *The Classical Weekly*, Vol. 23, No. 1 (Oct. 7, 1929), pp. 2-8

Published by: [Classical Association of the Atlantic States](#)

Stable URL: <http://www.jstor.org/stable/4389350>

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on its programme at the spring meeting, 1930, two or three papers, by scholars, on Vergil, secondly, by accepting Professor Knapp's offer to dedicate primarily to The Classical Association of the Atlantic States, and secondarily to the American Classical League, his forthcoming volume on Vergil, which is to include an Index to his revised editions of Vergil and Ovid, even fuller than the Index to his original edition of Vergil, and a Vergilian Bibliography.

These actions of the Executive Committee were approved by the Association.

The Committee on Resolutions, through its Chairman, Professor Hahn, presented a very elaborate report, in Latin, giving the hearty thanks of the Association to all those who had in any way contributed to the success of the meeting—the retiring officers, the members of the Local Committee of Arrangements, the authorities of the Baltimore City College, the officers of The Baltimore Classical Club and of The Washington Classical Club, those who had presented papers, and those who had discussed the papers.

The following officers were elected for 1929-1930: President, Miss Mary L. Breene, Peabody High School, Pittsburgh, Pennsylvania; Secretary-Treasurer, Professor Charles Knapp, Barnard College, Columbia University, New York City; Vice-Presidents, Miss Elsie I. Barrows, Syracuse, New York, Professor Casper J. Kraemer, Jr., Washington Square College, New York University, New York City, Mr. Harvey M. Dann, Barringer High School, Newark, New Jersey, Professor Horace W. Wright, Lehigh University, Bethlehem, Pennsylvania, Professor William D. Crockett, Pennsylvania State College, State College, Pennsylvania, Miss Mildred Gooding, High School, Wilmington, Delaware, Professor Herman L. Ebeling, Goucher College, Baltimore, Maryland, Professor Charles S. Smith, The George Washington University, Washington, D. C.

CHARLES KNAPP

CLOUDS, RAINBOWS, WEATHER GALLS, COMETS, AND EARTHQUAKES AS WEATHER PROPHETS IN GREEK AND LATIN WRITERS

In previous articles in *THE CLASSICAL WEEKLY* I have collected weather signs derived from the stars and the constellations and also from the sun and the moon¹. In this paper I am continuing my study of the weather lore of the heavens by gathering together the signs revealed by clouds, rainbows, weather galls, comets, and earthquakes. Some prophecies based upon the clouds in certain relations to the sun and the moon have already been noted².

¹The Classical Astral Weather Chart for Rustics and Seamen, 20.43-49, 51-54; Greek and Roman Weather Lore of the Sun and the Moon, 22.25-31, 33-37. Other studies in weather lore by the author to be found in *THE CLASSICAL WEEKLY* are An Animal Weather Bureau, 14.89-93, 97-100; The Folk Calendar of Times and Seasons, 16.3-7; The Plant Almanac and Weather Bureau, 17. 105-108; Magic and the Weather in Classical Antiquity, 18.154-157, 163-166.

²See *THE CLASSICAL WEEKLY* 22.25-31, 33-37.

The translations that I quote from the *Phaenomena* of Aratus are by G. R. Mair; those from the *De Signis* of Theophrastus are by Sir Arthur Hort³. Both ancient and modern works that I refer to frequently are given in the notes by the name of the author only, sometimes in abbreviated form, as indicated below, in the footnote⁴.

CLOUDS

Of the countless popular weather signs no signs are more widespread or more generally dependable than those derived from clouds. Existing everywhere and in manifold forms and hues, clouds feel and reflect the moods of Nature. They are gentle when Nature is gentle, and lowering and menacing when Nature is roused to anger. The savage who could not read the heavens would indeed be dull-witted. If we ourselves observe the clouds less than our ancestors did, it is only because of our indoor life and of the fact that the telegraph has enabled meteorologists to read conditions farther than the eye can see.

The ancients judged impending weather by the density, the size, and the general appearance of clouds⁵. Lucretius⁶ notes that in the spring the clouds are less dense. In winter light clouds are a sign of fine weather⁷.

...Again, if during a storm from the north there is a white gleam from that quarter, while in the south a solid mass of cloud has formed, it generally signifies a change to fair weather. Again when the north wind (Boreas) as it begins to blow violently stirs up a number of clouds, it indicates fair weather⁸.

After rain bronze-colored clouds toward sunset generally mean that the next day will be clear⁹. "Fair weather, too, shalt thou have, when by the sea-venge is seen a cloud low on the ground, never reaching a height, but penned there like a flat reef of rock"¹⁰. Clouds hanging low over the sea indicate that the storm will cease¹¹. Vergil¹² says that, when the clouds hang low and rest upon the fields, in vain will the watchful owl observing the sunset utter his ominous hoots.

"When there is mist, little or no rain follows"¹³. "Mist is what is left over when a cloud condenses into

³Both translations are in The Loeb Classical Library.

⁴Aratus = Aratus, *Phaenomena*; Aristotle = Aristotle, *Meteorologica*; Pliny = Pliny, *Naturalis Historia*; Seneca = Seneca, *Naturales Quaestiones*; Th. = Theophrastus, *De Signis*.

Modern works, cited only by authors' names, are as follows: Fanny D. Bergen, *Current Superstitions* (Volume 4 of *Memoirs of the American Folk-Lore Society*); H. H. C. Dunwoody, *Weather Proverbs* (United States of America: War Department, Signal Service Notes, No. 9, Washington, 1883); Edward B. Garriott, *Weather Folk-Lore and Local Weather Signs* (United States Department of Agriculture, Weather Bureau, Washington, 1903); Wm. J. Humphreys, *Weather Proverbs and Paradoxes* (Baltimore, Williams and Wilkins Co., 1923); Richard Inwards, *Weather Lore: A Collection of Proverbs, Sayings, and Rules Concerning the Weather* (London, Elliot Stock, 1898); Lean = Lean's *Collectanea*; Collection, by Vincent Stuckey Lean, of Proverbs (English and Foreign), Folk Lore, and Superstitions, also Compilations towards Dictionaries of Proverbial Phrases and Words, Old and Disused, 5 volumes in 4 (London, J. W. Arrowsmith, 1902-1904); T. M. Longstreth, *Reading the Weather* (New York, The Macmillan Company, 1925); D. E. Marvin, *Curiosities in Proverbs* (New York, G. P. Putnam's Sons, 1916); O. Freiherr v. Reinsberg-Düringsfeld, *Das Wetter im Sprichwort* (Leipzig, Hermann Fries, 1864); C. Swainson, *A Handbook of Weather Folk-Lore* (Edinburgh and London, Wm. Blackwood and Sons, 1873); Edward Vernon, *Is It Going to Rain?* (Edinburgh, Macniven and Wallace, 1903).

⁵Vegetius, *De Re Militari* 4.39, 41. ⁶361.

⁷Th. 51. Compare Vergil, *Georgics* 1.397: *tenuia nec lanæ per caelum vellera ferri*.

⁸Th. 53. ⁹Th. 51. ¹⁰Aratus 991-993.

¹¹Geoponica 1.2.4. Compare Aratus 858-861.

¹²Georgics 1.402-403. ¹³Th. 52.

water and is therefore rather a sign of fine weather than of rain; for mist might be called a barren cloud"¹⁴.

Though clouds may reveal many moods of the heavens, it is natural that they should be mentioned most frequently as portending welcome rains¹⁵ or menacing storms¹⁶. Sometimes

Gray monsters of the mist that ride
Across the ambient sky
Are nothing more than ambuscades
Where passing showers lie¹⁷,

but sometimes they are more threatening and warn the farmer to protect his crops and cattle or bid the mariner run to shelter¹⁸. Orphic Hymn 21 describes the cloud as 'crop-nourishing, heaven-crashing, rain-begetting, coursing through the world with winds, thundering, fiery'. It continues: 'I beseech thee now, dew-clad, flowing with breezes, to send crop-producing rains upon mother Earth'.

Fleece-like clouds herald the advent of rain¹⁹. Theophrastus regards them as portending storm when they appear at sunrise²⁰. An additional item is recorded by Pliny²¹: if they are scattered about in the east in great numbers they prophesy rain for the third day.

"If the clouds are of uniform colour, like a white membrane, it is a sign of storm"²². "Foul weather, too, will come, when of the clouds some are stationary, but others passing by and others following after"²³. "If during fine weather a cloud appears in the sky stretching a long way and torn to shreds, stormy weather will continue"²⁴. Likewise, "when the clear light from the stars is dimmed, though no thronging clouds veil, nor other darkness hide nor Moon obscure, but the stars on a sudden causelessly wax wan, hold that no more for sign of calm but look for storm"²⁵.

Plutarch describes as 'showering' the clouds known as Ploiades and quotes Theophrastus as saying that they are neither very watery nor very windy²⁶.

In summer light clouds signify wind²⁷. When clouds are carried through the heavens in clear weather, expect winds from the direction in which this occurs. If clouds gathered in the same place are scattered as the sun approaches, expect winds if this takes place toward the north, if toward the south, rains²⁸. "Also the winds which accompany the falling of the mists are

significant: if the breezes come from the east or south, rain is indicated; if from the west or north, breezes and cold weather"²⁹.

Stars too are meaningful in connection with mists, for, "if the Ass to the North of the Manger shine feebly through a faint mist, while the Southern Ass is gleaming bright, expect wind from the South; but if in turn the Southern Ass is cloudy and the Northern bright, watch for the North wind"³⁰.

Again, we are told³¹ that

the dawn is chill when Boreas has once made his onslaught, and at dawn a fruitful mist is spread over the earth from starry heaven upon the fields of blessed men: it is drawn from the ever flowing rivers and is raised high above the earth by windstorm, and sometimes it turns to rain towards evening, and sometimes to wind when Thracian Boreas huddles the clouds.

The story was current in antiquity that in certain seasons of the year the clouds over Scythia were so thick and gross that neither thunder nor lightning occurred³².

Xenophanes saw in the sea the fountain-head of clouds and winds and rivers³³. "If the land looks black from the sea, it indicates a north wind, if white, a south wind"³⁴. The Greeks had a proverb which runs as follows: "Never fear the cloud from the mainland as much as one from the sea in winter, but in summer fear the cloud from the dark mainland"³⁵. Elijah regarded as very significant the appearance of a cloud at sea³⁶:

And (he) said to his servant, Go up now, look toward the sea. And he went up, and looked, and said, There is nothing. And he said, Go again seven times.

And it came to pass at the seventh time, that he said, Behold, there ariseth a little cloud out of the sea, like a man's hand. And he said, Go up, say unto Ahab, Prepare thy chariot, and get thee down, that the rain stop thee not.

Accepting the conclusions of an earlier scholar³⁷ a recent book states that "The ram... was the rain-cloud which sailed away eastward in summer and winter, but at the spring and autumn equinoxes, when the so-called *Hellespontias* blows, came back as the life-giving ram"³⁸. With this compare a modern folk-saying current when thick clouds portend rain: "Here comes John Black and Gilbert Ram on his back"³⁹.

Long-range forecasts were sometimes made from the condition of the atmosphere.

...if after the spring equinox mists come down, it is an indication of breezes and winds by the seventh month, reckoning inclusively. Those mists which come down when the moon is in its first quarter indicate breezes

¹⁴Aristotle 1.9, 346 b (all translations of parts of this work are from E. W. Webster's translation).

¹⁵Alciphron, *Epistulae* 3.35, tells how peasants longed for the sight of a cloud during a drought.

¹⁶For example, Vergil, *Aeneid* 5.10-11: *Olli caerules supra caput adstitit imber noctem hiememque ferens, et inhorruit unda tenebris*. See also Tacitus, *Agricola* 12.3; Ammianus Marcellinus 20.11.25. Compare Quintus Smyrnaeus 2.194-195, 4.349-352.

¹⁷Don C. Seitz, *Cloud Shapes*, *The Outlook*, May 25, 1927, page 130.

¹⁸Aratus 413-419.

¹⁹Aratus 938-939. See also Vergil, *Georgics* 1.397; Varro *Atacinus*, as quoted by Servius on Vergil, *Georgics* 1.397; Lydus, *De Ostentis* 9 d (page 27 of C. Wachsmuth's edition, Leipzig, Teubner, 1897). In the neighborhood of Pisa people say: *Cielo a pecorelle*, *Acqua a catinelle* (this is quoted from Swainson, 201).

²⁰Th. 13. ²¹18.355. ²²Th. 45. ²³Aratus 1018-1020. See also Th. 45. In modern lore small clouds scudding before larger clouds are sometimes called 'weather carts'.

²⁴Th. 43. ²⁵Aratus 1013-1018. ²⁶Greek Questions 7 (*Moralia* 292 C).

²⁷Th. 31. Hort makes the suggestion, with a question mark after it, that the Greek word *kelades* may denote our 'mackerel sky'. ²⁸Pliny 18.355. See also 2.129: *Expectantur <venti> autem maxime unde nubes discussae adperuere caelum*.

²⁹Th. 57.

³⁰Aratus 905-908. ³¹Hesiod, *Works and Days* 547-553.

³²Diodorus 3.34.2.

³³H. Diels, *Die Fragmente der Vorsokratiker*, I, 63, No. 30 (Berlin, Weidmann, 1912).

³⁴Th. 31. ³⁵Th., *De Ventis* 10.60. See Aristotle, *Problemata* 26.57.

³⁶I Kings 18.43-44.

³⁷P. W. Forchhammer, *Die Sage vom Goldenen Vliesz*, *Jahrbücher für Philologie* 1875, 391-398. See, however, John A. Scott, *The Origin of the Myth of the Golden Fleece*, *The Classical Journal* 22.541.

³⁸J. R. Bacon, *The Voyage of the Argonauts*, 46-47 (London, Methuen and Co., 1925). ³⁹Lean, 1.404.

for that period, those which come down when the moon is in its third quarter indicate rain. And the more mists come down when the moon is assuming either shape, the more certainly is the result just mentioned indicated⁴⁰.

There are also weather signs to be drawn from the wind in certain associations with the sun and the moon. These I have gathered together in THE CLASSICAL WEEKLY 22.29, 33-36.

In his *Historia Ventorum* Francis Bacon gives a number of general signs, most of which are derived from classical sources⁴¹.

The formation of rain-clouds is thus explained by Lucretius⁴²:

Clouds are formed, when in this upper space of heaven many bodies flying about have in some one instant met together, of a rougher sort, such as are able, though they have got the very slightest holds of each other, to catch together and be held in union. These bodies first cause small clouds to form; and these next catch together and collect into masses and increase by joining with each other and are carried on by the winds continually until a fierce storm has gathered.

In the classical lands "the flail of the lashing hail" was and still is a terrible menace⁴³. Consequently, people studied the clouds in an effort to identify those which portended hail and tried to avert them by magical means. The glowing of a heavy cloud was supposed to threaten hail, a 'white storm', as it was called⁴⁴. Seneca⁴⁵, however, poked fun at the Stoics for believing that there were persons so skilled in observing the clouds that they could tell from the color which clouds portended hail.

The people of Cleonae appointed hail-guards or wardens whose duty it was to give warning of the approach of hail clouds and to try to turn them aside by sacrificing fowls⁴⁶. Another way to avert hail clouds was to burn chaff and sweepings in the garden⁴⁷. Still other methods of warding them off have been noted in previous papers in THE CLASSICAL WEEKLY⁴⁸. At the present time the Italian peasants often rely on processions in which an image of the Madonna is carried through the streets⁴⁹.

Since the weather has a close connection with the success or the failure of military operations, Vegetius takes space in his *De Re Militari* (4.38-41) to list what he considers the more dependable signs. As

already noted, he says (4.41) that clouds furnish information both by their appearance and by their size, but he does not enlarge upon the signs derived from them, obviously because the subject had been treated and the data were readily accessible⁵⁰.

It is instructive to note that a soldier of modern times, General Viscount Wolseley, urged army officers to become weatherwise by a constant study of the heavens. In *The Soldier's Pocket-Book for Field Service*⁵¹ he gives the following maxims based upon clouds:

...whether clear or cloudy, a rosy sky at sunset presages fine weather; a red sky in the morning, bad weather or much wind (perhaps rain); a grey sky in the morning, fine weather; a high dawn, wind; a low dawn, fair weather. Soft-looking or delicate clouds foretell fine weather, with moderate or light breezes; hard edged oily-looking clouds, wind. A dark, gloomy blue sky is windy; but a light, bright blue sky indicates fine weather. Generally, the softer the clouds look, the less wind (but perhaps more rain) may be expected; and the harder, more "greasy", rolled, tufted or ragged, the stronger the coming wind will prove. Also a bright yellow sky at sunset presages wind; a pale yellow, wet; and thus by the prevalence of red, yellow, or grey tints, the coming weather may be foretold very nearly; indeed, if aided by instruments, almost exactly. Small inky-looking clouds foretell rain; light scud-clouds driving across heavy masses show wind and rain; but, if alone, may indicate wind only. High upper clouds crossing the sun, moon or stars, in a direction different from that of the lower clouds, or the wind then felt below, foretell a change of wind.

In this connection it is worth while to quote a paragraph of more recent date in which technical names of clouds are given⁵²:

The cirrus presages good weather, but if it has a complicated or rapid movement announces a storm. A veil of cirro-stratus extending like a broad sheet in a direction different from that of the wind means a lowering of the barometer. If a halo at such times coincides with the direction of the wind and the lowering of the barometer, a period of cold weather is assured; but if, on the other hand, the barometer is stationary, rain alone will follow the appearance of the halo. The cumulus resembling cotton-bales means good weather, but sometimes when the base has a bag-like appearance rain may be looked forward to. The cumulo-nimbus brings hail, and the nimbus persistent rain or snow. If the heavens appear light, and especially blue, around the latter and the barometer is low a return of good weather is in sight.

CLOUDS HANGING OVER MOUNTAINS

Throughout the centuries the presence of a cloud upon a peak or mountain top has been a picturesque weather sign. In many lands this sign is still regarded as infallible. Perhaps there is no country so small as Greece which has so many mountainous weather prophets. "Every traveller in Greece will have noticed how the clouds swiftly gather round the highest mountain-top in the neighbourhood. In a short time the sky is covered with clouds, the roar of the thunder is

⁴⁰Th. 56.

⁴¹The Works of Francis Bacon, Collected and Edited by J. Spedding, R. L. Ellis, and D. D. Heath, 9.449-450, 454-455 (Cambridge, Massachusetts, Riverside Press, 1869).

⁴²6.451-458 (H. A. J. Munro's translation).

⁴³See Sir Archibald Geikie, *The Love of Nature among the Romans*, 247-248 (London, John Murray, 1912). For ancient references see, for example, Th., *Historia Plantarum* 4.14.1; Horace, *Carmina* 3.1.29; Epistles 1.8.4; Pliny 18.278. The frequency with which ancient and modern Italians have resorted to magic in order to avert the hail-cloud is eloquent testimony to the threat it contained.

⁴⁴Pliny 18.356. Compare the expression 'white calm', as used by Pierre Loti, *Pêcheur d'Islande*, Part I, Chapter VI, ad initium: "... il fait cette sorte de temps rare que les matelots appellent le *calme blanc*, c'est-à-dire que rien ne bougeait dans l'air, comme si toutes les brises étaient épuisées, finies".

⁴⁵4.6.1. ⁴⁶Seneca 4.6-7. ⁴⁷Palladius 1.35.1.

⁴⁸16.6; 18.155, 163. Diodorus says (5.55.3) that the Telchines at Rhodes could cause clouds and other kinds of weather.

⁴⁹Tony Cyriax, *Among Italian Peasants*, 120, 42 (New York, E. P. Dutton and Co., 1919. See THE CLASSICAL WEEKLY 19.229-230).

⁵⁰See 4.40: Sed omnia enumerare nominatim aut ineptum videtur aut longum, cum auctores plurimi non solum mensum sed etiam dierum rationem diligenter expresserint.

⁵¹Fifth edition, Revised and Enlarged, 285 (London, Macmillan, 1886).

⁵²Clouds as Weather Prophets, Harper's Weekly, December 16, 1911, Part I, (55.35).

heard, and the rain pours down"⁵⁴. This is an old story, since Cornutus⁵⁴ long ago said that everywhere rains were observed coming from the mountains. Theophrastus⁵⁵ remarked that, in general, places near mountains were observed to be either windy or rainy. He discusses⁵⁶ in great detail the significance of clouds resting upon mountains:

Of the remaining signs some belong specially to all such lands as contain high mountains and valleys, specially where such mountains extend down to the sea: for, when the winds begin to blow, the clouds are thrown against such places, and, when the winds change, the clouds also change and take a contrary direction, and, as they become laden with moisture, they settle down in the hollows because of their weight⁵⁷. Wherefore good heed must be taken to the local conditions of the region in which one is placed. It is indeed always possible to find such an observer, and the signs learnt from such persons are most trustworthy.

Another extended discussion is to be found in an astronomical codex⁵⁸:

'The clouds that float in airy form and show clear the tops of mountains indicate good weather, and appearing low upon the sea portend a cessation of storm; if resting upon the mountain tops, they are raised to the tops in a ring, as it were, from there will come the wind. If the heights of the mountains are clear and if the clouds approach their breasts, they show impending wind. Early morning mist falling on the ground and upon the plains signifies clearness, but on rising heavenward, it becomes a cloud and holds continual rains and winds. If the mist thickens, it portends a north wind; if it is watery or dewy, a southeast or a south wind. If the mist dissolves by the third hour, it signifies clear weather; if it lasts longer, it is the sea that will have clear air, good weather and a west wind.

If a cloud stands upright on a mountain-peak, it indicates storm; whence Archilochus's lines, "Mark you, Glaucus; deep ocean is now stirred up with waves, and about the heights of the Gyrae there rises a cloud erect, the sign of storm"⁵⁹.

From whatever quarter cloud streams out from a mountain-peak, wind will blow in the direction thus indicated. Clouds which cling to the back of the mountain will also produce wind from the back of it⁶⁰.

"It is a sign of fine weather when Olympus Athos and in general the mountains which give signs have their tops clear: so too is it, when clouds encompass them at sea-level"⁶¹. When mists descend from the mountains and settle in the valleys, fine weather is likewise promised⁶².

It was believed that clear mountain peaks presaged wind⁶³. It was thought, however, that on exceedingly high mountains there was no wind at all. Athos was included in this class since sacrificial offerings were found there undisturbed a year after they had been made⁶⁴.

"If there is a girdle of cloud half-way up Mount Athos, and if mountains in general wear such a girdle, there will generally follow a southerly wind"⁶⁵. "When Euboea has a girdle about it up to the waist, there will be rain in a short space"⁶⁶.

"It is a sign of storm when Athos Olympus and mountain-peaks in general are covered with clouds"⁶⁷. A cloud settling on the temple of Zeus Hellenius, which was situated upon an eminence in Aegina⁶⁸, portended rain⁶⁹.

An excellent figurative use of the menace of a cloud upon a mountain is put into the mouth of Hannibal. It is said that he uttered the following pleasantry when he was withdrawing from the contest with the dictator Minucius, who had been saved from destruction only by the timely intervention of Fabius: "Verily, did I not often prophesy to you that the cloud which we saw hovering upon the heights would one day burst upon us in a drenching and furious storm?"⁷⁰

There are several mountains whose weather indications are given in greater detail by Theophrastus:

"When at night a long stretch of white cloud encompasses Hymettus below the peaks, there will generally be rain in a few days"⁷¹. "If the lesser Hymettus, which is called the Dry Hill, has cloud in its hollows, it is a sign of rain: so also is it, if the greater Hymettus has clouds in summer on the top and on the sides: or if the Dry Hymettus has white clouds on the top and on the sides; also if the south-west wind blows at the equinox"⁷². "Again, if during a storm a long cloud stretches over Hymettus, it signifies that the storm will increase in force"⁷³.

"If cloud clings about Mount Pelion, it is an indication of rain or wind from the quarter to which it clings"⁷⁴.

If at the setting of the Pleiad there is lightning over Parnes Brilessus and Hymettus—when it appears over all three mountains, it indicates a great storm; when over the two lesser heights, a less violent storm; when over Parnes alone, fine weather⁷⁵. "If the western side of Parnes and the side towards Phyle are blocked with clouds during a north wind, it is a sign of storm"⁷⁶.

In a Latin poem it is said that, however clear the day may dawn, there always hovers above Etna a sluggish black cloud. Though a breeze may drive it away for a time, it always returns⁷⁷.

⁵⁴M. P. Nilsson, *A History of Greek Religion*, 113 (Oxford: At the Clarendon Press, 1925).

⁵⁵*Theologiae Graecae Compendium*, Chapter 6.

⁵⁶*De Ventis* 1.5. ⁵⁷*De Signis* 3.

⁵⁷The ancients understood, of course, that mountains too high to be surmounted by clouds caused the clouds to drop their moisture in the form of rain. See Th., *De Ventis* 1.5. 4.27; Aristotle, *Problemata* 26.7, 56. Compare, also, note 107, below.

⁵⁸*Catalogus Codicum Astrologorum Graecorum* 4. 110 (Bruxellis, In Aedibus Henrici Lamertini, 1903).

⁵⁹Th. 45 (quoted also by Plutarch, *De Superstitione* 8 [= *Moria* 160 B]); Heraclides, *Allegoriae Homericae* 4.

⁶⁰Th. 34. The first of these two signs is given by Aratus 920.

⁶¹Th. 51. See also Aratus 988-990; Pliny 18.356; *Geoponica* 1.2.4.

⁶²Pliny 18.357; Vergil, *Georgics* 1.401.

⁶³*Geoponica* 1.11.7. ⁶⁴Aristotle, *Problemata* 26.36. ⁶⁵Th. 34. ⁶⁶Th. 22. Hort comments as follows: "Evidently an Attic saying, of days when only the upper part of the Euboean mountains was visible".

⁶⁷Th. 43. See also Pliny 18.356.

⁶⁸Upon Mount Panhellenius. See Frazer's note on Pausanias 2.30.4.

⁶⁹Th. 24. ⁷⁰Plutarch, *Fabius* 12.4 (Perrin's translation, in *The Loeb Classical Library*). See also Livy 22.30.10.

⁷¹Th. 24. ⁷²Th. 20. ⁷³Th. 43. ⁷⁴Th. 22.

⁷⁵Th. 43. ⁷⁶Th. 47. ⁷⁷*Aetna* 33-337.

Among the Greeks, peaks and mountain-tops were favorite places for invoking winds or rain⁷⁸. Upon Mount Parnes and Mount Hymettus there were altars on which sacrifices were offered to showery Zeus⁷⁹. Aeacus ascended Mount Hellenius in order to pray to Zeus to end a drought. Amid his praying there was a loud clap of thunder, the heavens became clouded, and a heavy rainfall ensued⁸⁰. It is said that, out of gratitude for this answer to his prayer, Aeacus built a sanctuary of Zeus on Mount Pannellenius in Aegina⁸¹. Upon mountain-tops priests of Aristaeus assuaged the power of the stern dog-star and entreated Zeus to send wind by which quail are entangled in meshes⁸². Mount Pelion was the site of a sanctuary to which, when the heat of the dog-star was fiercest, there ascended very distinguished citizens and the young men in the vigor of youth, clad only in the skins of newly flayed sheep⁸³. During a drought sacrifices were made upon the altars of Zeus and Hera on Mount Arachnaeon, above Lessa⁸⁴. There was an altar to Lightning Zeus on Harma, to the northwest of Athens⁸⁵.

Commenting on Pausanias 1.32.2, Frazer says: "There was a propriety in worshipping Showery Zeus on Hymettus since clouds resting on Hymettus were signs of rain". Frazer suggests that a spot on the ridge of Mount Tmolus near Sardis may have been called the Birthplace of Zeus because clouds resting upon it were regarded as presaging rain⁸⁶. It would be folly, however, to try to explain all ceremonies on heights as due to some weather association. There were too many such ceremonies⁸⁷.

Much picturesque weather lore has gathered about the islands off the northeastern corner of Sicily. Polybius (34.11.12-20) preserves for us the weather associations of the craters in the volcanic Holy Island, one of the Lipari group:

Of the three craters one has partly fallen in, the other two remain perfect. The largest has a circular orifice with a circumference of five stades, but it gradually contracts to a diameter of fifty feet; it runs right down to the sea for a stade, so that the sea is visible in clear weather. When a south wind is about to blow, a thick mist envelopes the little island, so that even Sicily is invisible from it: but if there is going to be a north wind, bright flames rise from the crater and

shoot up high, and louder rumblings are emitted; but a west wind causes a medium display of both. The other two craters are of the same shape, but their eruptions are less violent. From the difference in the sound of the rumbling, and by observing from what point the eruptions and flames and smoke begin, the wind which is to blow on the third day from that time can be foretold. At least, some men in the Lipari Islands when weather-bound have foretold what wind was coming and have not been deceived⁸⁸⁻⁸⁹.

Pliny (3.94) also tells us that the smoke of Stromboli, now picturesquely called the 'lighthouse of the Mediterranean', enabled people to tell three days in advance what winds were going to blow. He adds that, since the home of Aeolus was in this region, the notion arose that the winds were governed by him. According to Diodorus (5.7.7) Aeolus was a petty king who, through ability to read, in fire, signs of the coming winds, came to be regarded as the ruler of the winds.

Apparently Stromboli has never ceased to be a weather guide, for it still serves such a purpose⁹⁰:

It appears...from the concurrent relation of the islanders, to be influenced by atmospheric changes, as storms, particularly those from the southward, are preceded by thick volumes of smoke, so that the native pilots are guided at night by its flame, and gain intimations of the weather in the day-time by its smoke.

Another account runs as follows⁹¹:

The inhabitants of Stromboli, who are mostly fishermen, are said to make use of that volcano as a weather-glass, the eruptions being comparatively feeble when the sky is serene, but increasing in turbulence during tempestuous weather, so that in winter the island often seems to shake from its foundations.

During my stay in Italy I bought a copy of the Guida Popolare a Monte Cavo e Rocca di Papa⁹², which is merely a vest pocket pamphlet. One paragraph (17) runs as follows:

"The ancient peoples of Latium had carefully observed that all the atmospheric changes of the weather, that is, the winds, the rains, etc., always started from the summit of Monte Cavo. And from there bad weather spread around over all the region of Latium. They decided then to build on the summit of the same Mount Albano a temple to the god Jupiter Optimus Maximus, with the idea that he, appeased by the prescribed sacrifices, might send blasts of healthful and propitious air over the entire region⁹³. Also to-day it happens time after time—and it is a fact observed by all—that, if the summit of Monte Cavo is

⁷⁸M. P. Nilsson, *A History of Greek Religion*, 90 (Oxford: At the Clarendon Press, 1925).

⁷⁹Pausanias 1.32.2.

⁸⁰Clemens Alexandrinus, *Stromata* 6.3.28. See also Pausanias 1.44.9, 2.20.7-8; Isocrates, *Evagoras* 13-15; Diodorus Siculus 4.61.1-2; Scholiast on Pindar, *Nemea* 5.9 (17); Apollodorus 3.12.6; Eudocia Augusta, *Violarium* 13.

⁸¹Pausanias 2.30.4.

⁸²Callimachus, *Aitia* 3.1.33-37 (page 209 of A. W. Mair's translation, in *The Loeb Classical Library*).

⁸³Dicaearchus 2.8 (*Geographi Graeci Minores*, 1.107, C. Müller's edition [Paris, Didot, 1872]).

⁸⁴Pausanias 2.25.10.

⁸⁵See *THE CLASSICAL WEEKLY* 20.155.

⁸⁶Frazer, *The Magic Art*, 2.360 (London, Macmillan, 1917). Lydus, *De Mensibus* 4.71, records the information upon which Frazer is commenting.

⁸⁷See *The Mountain-Cults of Zeus*, in A. B. Cook, *Zeus*, 2, Part II, 828-987; Margaret B. O'Connor, *Religion in the Plays of Sophocles*, 51 (*The Collegiate Press*, Menasha, Wisconsin, 1923. See *THE CLASSICAL WEEKLY* 20.66). Of some collateral interest in connection with this section of my paper is W. Capelle, *Berges- und Wolkenhöhen bei Griechischen Physikern* (Leipzig, Teubner, 1916). This is Heft V of *ΣΤΟΙΧΕΙΑ: Studien zur Geschichte des Antiken Weltbildes und der Griechischen Wissenschaft*.

⁸⁸E. S. Shuckburgh's translation.

⁸⁹The same story is told in Strabo 6.2.10. See also 1.2.15. Compare Aristotle 2.8, 367 a: "When a south wind is going to blow <in the Aeolian islands> there is a premonitory indication: a sound is heard in the places from which the eruptions issue".

⁹⁰W. H. Smyth, *Memoir Descriptive of the Resources, Inhabitants, and Hydrography, of Sicily and Its Islands*, 256 (London, John Murray, 1874).

⁹¹Sir Charles Lyell, *Principles of Geology*¹¹, 2.472 (New York, D. Appleton and Co., 1876). Compare Smyth, page 270 of the volume named in note 90: "From the strength of the concussions, and the violence of these gusts, the Lipariots pretend to foretell the changes of weather about to occur". The same author says (149) that the first autumnal rains on Etna "assume the form of snow on the summit; and the peasants below attentively observe whether the east or west side is covered earliest, because, in the former case, they expect a wet season, in the latter, a dry one".

⁹²Tipografia Eredi Cav. A. Befani, Rome, 1910. The pamphlet is very unpretentious. I value it only for its weather lore.

⁹³I have tried without success to find this idea in a Latin writer.

cloudy or foggy, the weather will be bad: if it is clear and cloudless above without the smallest cloud, the weather will be good for all Latium'.

To the same source (18) I am indebted for the following rimes:

Se Monte Cavo mette il cappello,
Lascia il bastone e prendi l'ombrello⁹⁴.

Quando fuma Giove,
Certamente piove⁹⁵.

Mountain tops are regarded as weather indexes the world around. I shall quote a few examples in order to show the various ways of describing the clouds resting upon the tops:

Quand Pilate a mis son chapeau,
Le temps sera serein et beau⁹⁶.

When Falkland Hill puts on his cap,
The Howe o' Fife will get a drap;
And when the Bishop draws his cowl,
Look out for wind and weather foul⁹⁷.

When Bredon Hill puts on his hat,
Ye men of the vale beware of that⁹⁸.

If Riving Pike do wear a hood,
Be sure the day will ne'er be good⁹⁹.

Benrinn's bonnetted may pass,
Benaigen bonnetted never pass¹⁰⁰.

When Criffel wears a hap,
Skiddaw wots full well o' that¹⁰¹.

There is a high wooded hill above Lochnaw Castle,
Take care when Lady Craighill puts on her mantle:
The Lady looks high and knows what is coming,
Delay not one moment to get under covering¹⁰².

At Capetown the sailors say, in reference to the cloud covering Table Mountain, "When the table cloth begins to spread, clear cables and prepare either to ride out the gale, or get out to sea"¹⁰³.

A striking name is "Rainmaker", which designates a mountain in Samoa. It seems to be the only weather bureau necessary¹⁰⁴:

Nature has supplied an unfailing weather guide to Pago Pago. Across the bay from the town is a flat-topped mountain, higher than the hills beside it. This is the "Rainmaker". Clouds may come up behind the other mountains that surround the bay and drift away again, but any time one comes up behind the Rainmaker and bumps against its sides, then it rains.

One of our own mountains gives very definite information of the advent of rain: "When Lookout Mountain has its cap on, it will rain in six hours"¹⁰⁵. Mount Baldy and Mount Diablo in California have weather associations. The names Rainy Butte, East Rainy

Butte, and West Rainy Butte, mountains of North Dakota, seem to speak for themselves.

Mountain-tops and peaks are among the dependable weather indexes¹⁰⁶. The reason for this has been well stated in simple language¹⁰⁷:

It will be readily understood that when a current of air, always laden with vapour, is driven by the wind against the side of a hill, it is at once deflected upwards. If the weather is fine and to remain fine, the barometric pressure being high, there is no condensation of the ascending vapour, and therefore no cloud. Accordingly when the hill loses its cap, we know that the weather is improving. On the other hand, if there is an approaching low pressure caused by a coming cyclone, the vapour-laden air as it is deflected upwards is cooled below the dew point, and condensation immediately following, cloud is formed. The hill-top puts on its cap, and this is frequently the first indication we have that a change to rainy weather is coming.

MODERN LITERATURE ON WEATHER LORE OF CLOUDS

There is so much modern weather lore of clouds that I have not attempted to give many parallels. The reader who is even superficially familiar with it may perhaps be grateful to me for not dwelling on the oft-mentioned mackerel skies and mares'-tails. I am listing, however, a number of valuable references to certain books, most of which are readily accessible: Bergen, 112-113; Dunwoody, 41-48, *et passim*; Garriott, 11-12; Inwards, 99-122; Lean, 1.403-404; Longstreth, 65-76; Marvin, 203-218; Reinsberg-Düringsfeld, 46-49; Swainson, 200-208; Watch the Clouds and Be Your Own Weatherman (with illustrations), The Detroit News, Metropolitan Section, September, 16, 1923, 14. Of special interest in connection with celestial weather lore in general is an article by W. P. Eaton, *Weather and the Sky*, Harper's Magazine 133.96-105. Many picturesque expressions are used in the section devoted to clouds in an article by Walter Gregor, *Weather Folk-Lore of the Sea*, 2 (1891), 468-482.

The more reliable cloud signs, together with explanations for their reliability, are given by Henry J. Cox, *How to Predict To-morrow's Weather*, The American Magazine, August, 1920, 26-28, 95-100, *passim*; Humphreys (with fine illustrations), 47-54; Longstreth, 65-76; Vernon, 26-32, 89-101; Robert DeC. Ward, *Weather Proverbs: Good and Bad*, Harvard Alumni Bulletin, February 19, 1925, 614-621, *passim*. E. B. Dunn, *The Weather and Practical Methods of Forecasting It*¹⁰⁸, states that "clouds are among the most reliable of the natural phenomena to be considered in calculating changes of the weather", and then gives three pages (270-272) of dependable indications.

⁹⁴If Monte Cavo dons his cap, leave your cane and take your umbrella'.

⁹⁵When Jove smokes, He certainly soaks'. ⁹⁶Swainson, 208. ⁹⁷Swainson, 206. "Falkland Hill and Bishop Hill are two prominent conical eminences in the Lomond range": Swainson, 206.

⁹⁸Swainson, 205. The hill is in Worcestershire.

⁹⁹Swainson, 207. The hill is in Lancashire.

¹⁰⁰Vernon, 59. The hills overlook the Moray Firth.

¹⁰¹Swainson, 206. The sign is thus interpreted in Dumfries and Kirkpatrick-Fleming.

¹⁰²Swainson, 205-206. ¹⁰³Vernon, 59. ¹⁰⁴From a newspaper clipping. ¹⁰⁵Inwards, 122.

¹⁰⁶For other instances see Inwards, 117-122; Swainson, 204-208; Lean, 1.387-388; Vernon, 58-62; E. M. Wright, *Rustic Speech and Folk-lore*, 314 (Oxford University Press, 1913); Scott, *The Pirate*, Chapter 4.

¹⁰⁷Vernon, 60-61. See also Humphreys, 52; Longstreth, 73-74. The ancients understood, of course, why clouds striking mountains dropped their moisture: see note 57, above. In Arrian 6.25 it is explained that clouds driven against the mountains of Godrosia were unable to pass the summits and hence dissolved into rain. ¹⁰⁸269 (second edition, New York, Dodd, Mead and Co.: undated).

The following works contain beautiful illustrations of the various kinds of clouds, but no popular lore: C. J. P. Cave, *Clouds and Weather Phenomena*, for Artists and Other Lovers of Nature¹⁰⁹; W. J. Humphreys, *Fogs and Clouds*¹¹⁰; McFall Kerbey, *Toilers of the Sky*, *The National Geographic Magazine* 38 (1925), 163-190. An anonymous article on *Painting Clouds for Weather Forecasts* appeared in *Popular Mechanics* 44. 803-804.

(To be concluded)

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PRICES OF REAL ESTATE, ANCIENT AND MODERN

When Lanciani's first book in English was published (*Ancient Rome in the Light of Recent Discoveries*, Boston and New York, Houghton Mifflin and Company, 1889), I read it at once. One passage in particular has always lingered in my memory. It is to be found in the chapter entitled *Public Places of Resort* (74-105; see especially 83-84):

...So enormous was the sum of money which he [= Julius Caesar] spent in the year 702 to purchase the area for his new forum (an extension of the old one) that even the unimpressionable Pliny exclaims, *pyramides regum miramur, cum solum tantum foro exstruendo HS milles Caesar dictator emerit!* "We wonder at the Egyptian pyramids, when Caesar, as dictator, spent one hundred millions of sesterces merely for the ground on which to build his forum!" The sum of one hundred millions of sesterces, mentioned by Pliny and confirmed by Suetonius, corresponds to four million dollars;

and as the area purchased by Caesar does not exceed ninety thousand square feet, it is evident he must have paid, on an average, \$44.45 per <square> foot....

In *The New York Sun*, March 14, 1909, the following item appeared:

The largest real estate deal made in the financial district in several years was put through yesterday. The Fourth National Bank, which owns and occupies the northeast corner of Pine and Nassau streets, acquired from the Germania Life Insurance Company the adjoining building at the southeast corner of Cedar and Nassau streets and is now in control of the entire block front on the east side of Nassau street from Pine to Cedar street.

The Germania Life Insurance Company has been holding its property at \$1,500,000, and it is understood that the actual price paid was close to that figure. The plot measures 73.1 feet on Nassau street and 73.2 feet on Cedar street. The average price per square foot was about \$307. This figure has been surpassed by only three other sales of New York city real estate. Two small plots at the southwest corner and the southeast corner of Broad and Wall streets sold over thirty years ago at the rate of \$330 and \$348 a square foot respectively. The southeast corner of Broadway and Wall street brought \$583 a square foot four years ago. This is the record price for real estate in New York city....

While I was away from my desk this summer, seeking change and rest, I read an article in *The Saturday Evening Post*, by Mr. Joseph P. Day, the well-known New York City auctioneer, in the course of which the statement was made that parcels of real estate in New York City have brought as much as \$800 per square foot. I cannot give the exact reference, but I am sure that the article appeared in late August or early September.

CHARLES KNAPP

¹⁰⁹Cambridge: At the University Press, 1926.

¹¹⁰Baltimore, The Williams and Wilkins Co., 1926.



Clouds, Rainbows, Weather Galls, Comets, and Earthquakes as Weather Prophets in Greek and Latin Writers (Concluded)

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Reviewed work(s):

Source: *The Classical Weekly*, Vol. 23, No. 2 (Oct. 14, 1929), pp. 11-15

Published by: [Classical Association of the Atlantic States](#)

Stable URL: <http://www.jstor.org/stable/4389353>

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... Better be a poor honest barber with a good conscience, and time to repent of my sins upon my death-bed, than be cut off (God bless us) by a musket shot, as it were in the very flower of one's age, in the pursuit of riches and fame. What signify riches, my dear friend? do they not make unto themselves wings? as the wise man saith; and does not Horace observe, *Non domus et fundus, non aeris acervus et auri Aegroti domini deduxit corpore febres, Non animo curas?*....¹³

In Chapter XVII, Random, who is minded to join the English navy, is being examined in Surgeons' Hall. Two of the examiners get into a dispute over a medical matter. One asserted that there was very good authority for the view he held (111).

... Here he was interrupted by the other, with "Sir, excuse me, I despise all authority. *Nullius in verba*!¹⁴ I stand upon my own bottom."....

In Chapter XLV, page 325, a certain physician discusses the meanings of the English verb 'drink', and those of Latin *bibere* and *potare* and Greek "*pinein* or *potecin*". Random comments thus (326):

... I could not help smiling at this learned and important investigation; and, to recommend myself the more to my new acquaintance, whose disposition I was by this time well informed of, I observed, that what he alleged did not, to the best of my remembrance, appear in the writings of the ancients; for Horace uses the words *poto* and *bibo* indifferently for the same purpose, as in the twentieth ode of his first Book:

Vile potabis modicis Sabinum cantharis,—
—et proelo domitam Caleno tu bibes uvam....¹⁵
(To be concluded) CHARLES KNAPP

CLOUDS, RAINBOWS, WEATHER GALLS, COMETS, AND EARTHQUAKES AS WEATHER PROPHETS IN GREEK AND LATIN WRITERS

(Concluded from page 8)

THE RAINBOW

The appearance of a rainbow or the drawing of water by a rainbow meant rain or wind¹¹¹. The bow is called *imbriifer*¹¹², and *pluvius*¹¹³. It is frequently referred to as 'drinking' water¹¹⁴. A story was created to the effect that Iris had the head of a bull and drank up the waters of rivers¹¹⁵. The threat conveyed by the bow was not the same for every quarter in which it showed itself¹¹⁶.

If it rises toward the south, it will bring a heavy fall. The rain in that quarter, such is its force, cannot be mastered by the strongest midday sun. If it shine toward the west, there will be only a dew or a light rain. If it rise in the east or thereabouts, it prognosticates fine weather¹¹⁷.

In our own lore a rainbow in the west betokens wet weather; one in the east betokens dry weather¹¹⁸.

¹¹¹Horace, *Epistulae* 1. 2. 47-49. Note that Smollett twice gives *aul* instead of *el*; he was quoting from memory, no doubt, and was tricked by his memory, as many another was before him and has been since his times.

¹¹²Horace, *Epistulae* 1.1.14. Horace's exact words are (13-15). *Ac ne forte roges quo me duce, quo lare tuter, nullius addictus iurare in verba magistri, quo me cumque rapit tempestas deferor hospes.* ¹¹³Horace, *Carmina* 1.20.1-2, 9-10.

¹¹⁴W. E. Leonard, *The Fragments of Empedocles*, 35. Fragment 50 (Chicago, The Open Court Publishing Co., 1908). See also Martial 12.29.6; Ovid, *Metamorphoses* 1. 270-271.

¹¹⁵Statius 9.405. ¹¹⁶Horace, *Ars Poetica* 18.

¹¹⁷Vergil, *Georgics* 1.380-381. *Bibit ingens arcus; Plautus, Curculio* 133 *Ecce autem bibit arcus!* Pluet, credo, hercle hodie; Lucan 4.80-82; Propertius 3.5.32.

¹¹⁸Plutarch, *Moralia* 804 B. ¹¹⁹Seneca 1.6.1.

¹²⁰Seneca 1.6.2 (J. Clarke's translation).

¹²¹D. L. Thomas and L. B. Thomas, *Kentucky Superstitions*, Nos. 2613, 2614 (Princeton University Press, 1920).

The rainbow is either solar or lunar¹¹⁹. Aristotle¹²⁰ tells us that it was formerly thought that there were no lunar rainbows. If there was to be one, it had to be at (or near) full moon, and then only as the moon was rising or setting. For this reason, he explains¹²¹, there had been only two lunar rainbows in more than fifty years. Rainbows were less frequent in summer than in winter¹²².

The double rainbow is a sign of rain¹²³. Many rainbows mean a long-continued rain¹²⁴. Rainbows occurring together signify storm after clear weather or clear weather after storm¹²⁵, but Pliny¹²⁶, owing to their frequency, does not regard rainbows as being of significance and says that they do not portend, with certainty, either rainy or clear days. Aristotle tells us that there are never more than two rainbows at the same time¹²⁷. "Three rainbows or more are not found because even the second is fainter, so that the third can have no strength whatever and cannot reach the sun at all"¹²⁸.

A despatch from Boston to the New York Times, dated December 23, 1925, and printed on December 24, says in part:

With the strong wind that drove the rain clouds of the past few days seaward there appeared today three suns and five rainbows, which turned the sky into a bank of colored clouds. The sun was surrounded by two circular rainbows, whose colors were augmented by three half circular ones, all aiding in producing a beautiful mass. In the midst of these, at various angles, appeared two other suns which, with the real one, gave the optical impression that more than one sun appeared....

According to the meteorologists these 'spots' and rainbows have no particular significance. Old school weather prophets, however, insist that they point to a long hard winter.

Rainbows may occur when oars are raised out of the sea or even around lamps¹²⁹. A rainbow seen around or through a lamp signifies rain from the south¹³⁰.

Rainbow lore is used with pleasing effect by Quintus Smyrnaeus (1.62-69)¹³¹:

Then joyed Troy's folk, despite past agonies,
As when, far-gazing from a height, the hinds
Behold a rainbow spanning the wide sea,
When they be yearning for the heaven-sent shower,
When the parched fields be craving for the rain;
Then the great sky at last is overgloomed,
And men see that fair sign of coming wind
And imminent rain, and seeing, they are glad
Who for their corn-fields' plight sore sighed before.

An oft-quoted modern rhyme is the following¹³²:

The rainbow in the morning
Is the shepherd's warning
To carry his coat on his back;
The rainbow at night
Is the shepherd's delight,
For then no coat will be lack.

¹¹⁹Seneca 1.10.

¹²⁰*Meteorologica* 3.2, 372. See also Seneca 1.3.1.

¹²¹*Meteorologica* 3.2, 372. ¹²²Bede, *De Natura Rerum* 31.

¹²³Aratus 940; *Geoponica* 1.3.5. Compare Pliny 18.353.

¹²⁴Th. 22.

¹²⁵Lydus, *De Ostentis* 9 d, page 27 of C. Wachsmuth's edition (Leipzig, Teubner, 1897). For a figurative use of the weather lore of rainbows see Ammianus Marcellinus 20.11.130.

¹²⁶2.150. ¹²⁷*Meteorologica* 3.2, 371 b. See also Pliny 2.151.

¹²⁸*Meteorologica* 3.5, 375 b. ¹²⁹*Ibidem*, 3.4, 374 a. ¹³⁰Th. 13.

¹³¹A. S. Way's translation. ¹³²Marvin, 206.

If the green be large and bright in the rainbow, it is a sign of continued rain. If red be the strongest colour, there will be rain and wind together. After much wet weather the rainbow indicates a clearing up. If the bow disappears all at once, there will follow serene and settled weather. The bow in the morning, rain will follow; if at noon, heavy rain; if at night, fair weather. The appearance of double or triple bows indicates fair weather for the present, but heavy rains soon¹³³.

Several weather maxims derived from the rainbow are dependable¹³⁴. Scientific explanations for their reliability have been given by Mr. Wm. J. Humphreys (33-36), but they are too long to be quoted here.

WEATHER GALLS (Πάβοι, Virgae)

There are seen in the sky at times 'small fragmentary appearances'¹³⁵ which the Greeks called *πάβοι*, 'rods', a term which the Romans translated by *virgae*. They are incomplete¹³⁶ or secondary rainbows. They are popularly known as weather-galls, water-galls, weather-gaws, wind-galls, wind-dogs.

Mock suns and rods are always seen by the side of the sun, not above or below it nor in the opposite quarter of the sky. They are not seen at night but always in the neighbourhood of the sun, either as it is rising or setting but more commonly towards sunset¹³⁷.

'Rods' were regarded by the Greeks as a sign of rain, but less certain than mock suns¹³⁸. When they were seen in the south, they were more dependable indications than when they were seen in the north¹³⁹. The Romans looked upon them as being just as sure signs of rain as rainbows¹⁴⁰. Eustathius¹⁴¹ says of those seen in the clouds in the morning that they signify severe storms and squalls or some other disturbance of the heavens.

Since modern weather lore of secondary rainbows is scattered I am giving several examples. In *The Rape of Lucrece* (1586-1589) Shakespeare writes:

And round about her tear-distained eye
Blue circles stream'd, like rainbows in the sky:
These water-galls in her dim element
Foretell new storms to those already spent.

The weather's taking up now,
For yonder's the weather gaw;
How bonny is the east now!
Now the colors fade awa'¹⁴².

A weather-gall at morn, fine weather all gone;
A rainbow towards night, fair weather in sight.
Rainbow at night, sailor's delight;
Rainbow in morning, sailors take warning¹⁴³.

"It will not soften into rain alone", said Minna;
"see how much heavier the clouds fall every moment,
and see these weather-gaws that streak the lead-
coloured mass with partial gleams of faded red and
purple"¹⁴⁴.

¹³³Inwards, 136.

¹³⁴Current adages may be found in Bergen, 109; Dunwoody, 70-71; Inwards, 134-137; Marvin, 205-206; Lean, 1.406; Swainson, 194-198; Thomas, Nos. 2610-2615; Vernon, 52-54; H. Gaidoz et E. Rolland, *L'Arc-en-Ciel*, Melusine 2.9-18. (Melusine is the name of a French periodical, somewhat like Folk-Lore).

¹³⁵Aristotle 3.4, 374 a.

¹³⁶*imperfecti arcus*, Seneca 1.9.1.

¹³⁷Aristotle 3.2, 372 a.

¹³⁸Aristotle, 3.6, 377 b. ¹³⁹Th. 11.

¹⁴⁰Seneca 1.9.1.

¹⁴¹Eustathii Hexaemeri Metaphrasis, 6.4 (Migne, *Patrologia Latina*, 53.925; see also *Patrologia Graeca*, 18.720).

¹⁴²A Scotch rhyme quoted by Marvin, 206.

¹⁴³An English nautical rhyme quoted by Marvin, 206.

¹⁴⁴Scott, *The Pirate*, Chapter 4.

It seems worth while to quote here three figurative references by Horace Walpole to the weather-gall: "False good news are always produced by true good, like the watergall by the rainbow"¹⁴⁵; "...but what signifies repeating the faint efforts of an old watergall opposed to its own old sun"¹⁴⁶; "Thank heaven it is complete, and did not remain imperfect like a watergall"¹⁴⁷.

COMETS

As a rule the appearance of a comet signified wind, but, if there were many of them, drought also¹⁴⁸. Under some conditions comets portended cold¹⁴⁹. There were supposed to bring rain storms too¹⁵⁰.

Even Aristotle¹⁵¹ was under the influence of the popular weather lore of comets:

So when there are many comets and they are dense, it is as we say, and the years are clearly dry and windy. When they are fewer and fainter this effect does not appear in the same degree, though as a rule the wind is found to be excessive either in duration or strength. For instance when the stone at Aegospotami fell out of the air—it had been carried up by a wind and fell down in the daytime—then too a comet happened to have appeared in the west. And at the time of the great comet¹⁵² the winter was dry and north winds prevailed, and the wave was due to an opposition of winds. For in the gulf a north wind blew and outside it a violent south wind. Again in the archonship of Nicomachus¹⁵³ a comet appeared for a few days about the equinoctial circle (this one had not risen in the west), and simultaneously with it there happened the storm at Corinth.

Seneca warns¹⁵⁴

'that the rising of a comet does not convey a threat of wind and rain in the immediate future, as Aristotle says, but casts suspicion over the whole year. Hence it is plain that the comet has not derived prognostications from its immediate surroundings to reveal for the immediate future, but that it has them stored up and buried deep within by the laws of the universe. The comet which appeared in the consulship of Paterculus and Vopiscus fulfilled the anticipations of this kind entertained by Aristotle, and for that matter by Theophrastus; for there were everywhere severe and prolonged storms, while in Achaia and Macedonia cities were overturned by earthquakes'.

The comet called *lampas* ('torch'), when it appeared in the east, involved all the lands of the Orient in misty weather injurious to crops; in the south, it caused Africa to struggle with drought and a plague of snakes; in the west, it brought to Italy continual overflowing of the streams; in the north, it meant hunger for people living in that quarter¹⁵⁵. The comet *lampadidas* ('torch-bearer'), when turned toward the east, portended for Persia and Syria drought, thunderbolts, destruction of crops, and the burning of palaces¹⁵⁶. The Chaldeans believed that comets as well as both lunar and solar eclipses signified wind, rain, and terrible heat¹⁵⁷.

¹⁴⁵The Letters of Horace Walpole, Earl of Orford, edited by Peter Cunningham, 1.310 (London, Henry G. Bohn, 1861).

¹⁴⁶*Ibidem*, 6.187. ¹⁴⁷*Ibidem*, 6.1.

¹⁴⁸Th. 34; Aratus 1091-1093; Aristotle 1.7, 344 b; Pl. 2.91; Bede, *De Natura Rerum* 24; Claudian, *Proserpina* 1.233.

¹⁴⁹Th. 57. ¹⁵⁰Seneca 7.28.1; Claudian, *De Bello Gildonico* 15.496.

¹⁵¹*Meteorologica* 1.7, 344 b.

¹⁵²373-372 B. C. ¹⁵³341-340 B. C. ¹⁵⁴7.28.2.

¹⁵⁵Servius on Vergil, *Aeneid* 10.272.

¹⁵⁶See C. Wachsmuth's edition of Ioannis Laurentii Lydi *Liber de Ostentis et Calendaria Graeca Omnia*, page 168 (Leipzig, Teubner, 1897).

¹⁵⁷Diodorus 2.30.5.

If it thundered on May 27 or 28 in the neighborhood of Rome, there would be signs from heaven and a comet would shine forth¹⁵⁸.

Homer¹⁵⁹ speaks of a star which he calls a bad sign for sailors and for armies. Since comets bring bad weather and also war and disasters, this star may have been a comet.

It is probable that the reference in Lydus, *De Ostentis* 4, is to meteors¹⁶⁰. It is there stated that stars coursing from the north or the south signify the rising of strong winds; if one comes from the north, making furrows of fire, it is a sign of thunder, thick air and a stronger wind from the north; if one come from the south, the south wind will blow.

Aristotle¹⁶¹ refutes the statement that comets appear only in the north and at the time of the summer solstice. Seneca¹⁶² sees no basis for the belief that they occur only in conjunction with wind, arguing that, if they arose with the wind, they would gain strength with it, and would wane as the wind abated.

A few other examples of the weather lore of comets are to be found in *THE CLASSICAL WEEKLY* 20.46.

Even at the present time "Comets are said to bring cold weather"¹⁶³. "In France comets are thought to improve the grape crop, and wine that is made during the year of their appearance is called 'Comet Wine' "¹⁶⁴. . . . The comet of 1811 obtained in Western Europe, and especially in Great Britain, fame of a very un-astronomical character. Its year of appearance was also the year of an unusually celebrated port wine vintage in Portugal, and 'Comet Wine' figured for a long period of years, first of all in the price-lists of wine merchants, and afterwards in the cellar books of many private houses, and finally in the advertisements of auction sales¹⁶⁵.

Any unusual weather that prevails while a comet is visible is naturally connected with the comet. To Halley's Comet, for instance, have been ascribed cold, drought, rains, floods, and earthquakes¹⁶⁶. A newspaper clipping I saved in 1921 tells how the hot, rainless weather of the summer of that year was attributed to a comet. The association of comets with heat is widespread¹⁶⁷.

That hot years have in general more comets than cold ones is very true, and for the simple reason that hot years giving clear skies are more favourable for the discovery of comets than cold years, which so often mean cloudy skies¹⁶⁸.

EARTHQUAKES

It may seem a little incongruous to the reader for me to include earthquakes in this paper, but weather lore, like politics, makes strange bedfellows. In ancient superstition comets and earthquakes are very frequently mentioned in the groups of portents that occurred just before dire calamities. A better justification, perhaps, is the fact that Aristotle in his *Meteoro-*

logica¹⁶⁹ discusses the causes and significance of earthquakes.

In this section of my paper I desire to put modern lore first and to quote two picturesque passages from Bret Harte's stories:

One night it was very warm; the usual trade-winds had died away before sunset, leaving an unwonted hush in sky and plain. There was something so portentous in this sudden withdrawal of that rude stimulus to the otherwise monotonous level that a recurrence of such phenomena was always known as 'earthquake weather.' The wild cattle moved uneasily in the distance without feeding; herds of unbroken mustangs approached the confines of the hacienda in vague timorous squads. The silence and stagnation of the old house was oppressive, as if the life had really gone out of it at last. . . .¹⁷⁰

"Well, this yer earthquake was ten years ago, just after I came. I reckon I oughter remember it. It was a queer sort o' day in the fall, dry and hot as if thar might hev bin a fire in the woods, only thar was n't no wind. Not a breath of air anywhar. The leaves of them alders hung straight as a plumb-line. Except for that thar stream and that thar wheel, nothin' moved. Thar was n't a bird on the wing over that cañon; thar was n't a squirrel skirmishin' in the hull wood; even the lizards in the rocks stiffened like stone Chinese idols. It kept gettin' quieter and quieter, until I walked out on that ledge and felt as if I'd have to give a yell just to hear my own voice. Thar was a thin veil over everything, and betwixt and between everything, and the sun was rooted in the middle of it as if it could n't move either. Everythin' seemed to be waitin', waitin', waitin'. Then all of a suddin suthin' seemed to give somewhar! Suthin' fetched away with a queer sort of rumblin', as if the peg had slipped under creation"¹⁷¹.

Were Aristotle to come back to-day with a knowledge of English, there would be absolutely nothing strange to him in the meteorology of these passages. He might in fact claim that Bret Harte had stolen not his thunder but his earthquakes. Aristotle says¹⁷² that "most earthquakes and the greatest are accompanied by calm", although some are attended by wind. During the day earthquakes occur most frequently about noon, since that is the calmest part of the day, but most of them and the severest take place at night, because the night is calmer than the day¹⁷³.

Aristotle's theory¹⁷⁴ is that wind is generated by the evaporation of moisture through the heat of the sun or the earth's own fire, and that this wind flows sometimes outwards, sometimes inwards, and sometimes is divided. Since earthquakes occur when, to use Shakespeare's words¹⁷⁵,

the teeming earth
Is with a kind of colic pinch'd and vex'd
By the imprisoning of unruly wind
Within her womb; which, for enlargement striving,
Shakes the old beldam earth and topples down
Steeple and moss-grown towers,

it follows that the calm "must be most marked before the more violent earthquakes, for when the wind is not part outside the earth, part inside, but moves in a single body, its strength must be greater"¹⁷⁶.

¹⁵⁸See Lydus, *De Ostentis* 38. ¹⁵⁹*Iliad* 4.75-76.

¹⁶⁰The discussion of comets proper is postponed to Sections 10-15.

¹⁶¹1.6, 343 a. ¹⁶²7.7.1. ¹⁶³Inwards, 77. ¹⁶⁴Marvin, 207.

¹⁶⁵G. F. Chambers, *The Story of the Comets*², 142 (Oxford: At the Clarendon Press, 1910).

¹⁶⁶James C. Watson, *A Popular Treatise on Comets*, 31-33 (Philadelphia, James Challen and Son, 1861). See also 34-35.

¹⁶⁷Chambers, as cited in note 165, page 234.

¹⁶⁸*Ibidem*, 235.

¹⁶⁹2.7, 365 a - 2.8, 369 a.

¹⁷⁰*The Mystery of the Hacienda, The Writings of Bret Harte*, 10.150-151 (Boston and New York, Houghton Mifflin Co., 1906).

¹⁷¹In a Hollow of the Hills, *ibidem*, 10.42-43.

¹⁷²2.8, 366 a. ¹⁷³*Ibidem*, 1742.8, 365 b.

¹⁷⁴Henry the Fourth, Part I, 3.1. 28-33. ¹⁷⁵2.8, 367 a.

Both calm and sharp frost sometimes precede earthquakes at sunrise¹⁷⁷. "The cold comes because the evaporation which is naturally and essentially hot enters the earth"¹⁷⁸.

There is another sign which is seen in fine weather either by day or a little after sunset. It is "a little, light, long-drawn cloud...like a long very straight line. This is because the wind is leaving the air and dying down"¹⁷⁹.

The idea that there was a lull or calm just before earthquakes was repeated time and again by Greek and Latin writers¹⁸⁰, and I see no reason why this tradition should not have come down to modern times unbroken. Some of the weather lore in old New England almanacs can be traced back through English books on husbandry to Aratus and Theophrastus.

Cassius Dio¹⁸¹ tells us that an earthquake at Antioch in 115 A. D. was preceded by winds and many thunderbolts. Aristotle says¹⁸²: "It is true that some take place when a wind is blowing, but this presents no difficulty. We sometimes find several winds blowing simultaneously. If one of these enters the earth we get an earthquake attended by wind. Only these earthquakes are less severe because their source and cause is divided". Seneca¹⁸³ notes that two winds have sometimes been blowing during earthquakes. After south winds have been blowing, earthquakes are especially dangerous¹⁸⁴.

In speaking of the climate of Sicily a modern writer states¹⁸⁵ that the earthquakes he felt

were generally preceded by a peculiar density of the atmosphere, the winds were variable, and the waters turbid. They however frequently happen also in fine weather, when nothing remarkable is indicated by the eudiometric instruments. I have more than once experienced their effect on board a ship, and from the sudden electric nature of the shock could scarcely believe that we had not struck upon an unknown shoal. Ancient sailors likewise felt earthquakes at sea¹⁸⁶.

Pausanias¹⁸⁷ gives an excellent summary of ancient views regarding conditions prior to earthquakes:

Ominous signs, vouchsafed by the god <Poseidon>, foretell the approach of great and far-reaching earthquakes. The nature of the signs is generally the same. For earthquakes are preceded either by heavy and continuous rains or long droughts¹⁸⁸. The weather, too, is unseasonable. If it is winter, the weather is sultry; if it is summer, there is a haze¹⁸⁹, and the sun's disc appears of an unusual colour, slightly inclining

either to red or dun. Springs of water mostly dry up¹⁹⁰. Sudden gusts sometimes sweep across the country, blowing the trees down. At times, too, the sky is shot with sheets of flame. Stars are seen of an aspect never known before, and strike consternation into beholders. Moreover, a mighty murmur is heard of winds blowing underground¹⁹¹. And many more signs there are whereby the god gives warning of the approach of violent earthquakes.

Most of the signs enumerated by Pausanias are still regarded by the popular mind as certain prognostics of the catastrophe, and this belief is sometimes justified by the event¹⁹².

The drying up of springs and wells before or after earthquakes has been noted by modern writers¹⁹³. According to a newspaper clipping springs fall around Vesuvius before an outburst of the mountain¹⁹⁴. One ancient authority held that in summer drought was a contributing factor to earthquakes, while in winter rain helped to cause them¹⁹⁵.

In modern times, previous to the occurrence of an earthquake in its neighborhood "Stromboli has been observed to be covered with dense clouds of smoke, and to emit, with increased activity, unusually ardent flames"¹⁹⁶.

In connection with Pausanias's list of phenomena attending earthquakes Sir James G. Frazer pertinently quotes from Sir Charles Lyell's *Principles of Geology*¹⁹⁷:

Irregularities in the seasons preceding or following the shocks; sudden gusts of wind, interrupted by dead calms; violent rains at unusual seasons, or in countries where, as a rule, they are almost unknown; a reddening of the sun's disk, and haziness in the air, often continued for months; an evolution of electric matter, or of inflammable gas from the soil, with sulphurous and mephitic vapours; noises underground, like the running of carriages, or the discharge of artillery, or distant thunder; animals uttering cries of distress, and evincing extraordinary alarm, being more sensitive than men to the slightest movement; a sensation like seasickness, and a dizziness in the head, experienced by men:—these, and other phenomena...have recurred again and again at distant ages, and in all parts of the globe.

Modern writers call attention to the restlessness of animals before earthquakes. The only classical reference I have to such a thing is one in Pliny¹⁹⁸, who observes that birds upon their perches betray alarm as earthquakes come.

According to a newspaper clipping, popular belief endows a widely distributed sensitive plant of the tropics, *Abrus Precatorius*, with the ability to predict earthquakes.

In antiquity the heavens too were studied in an effort to anticipate changes in meteorological conditions. To the Chaldeans was attributed the ability to predict wind storms, rains, severe drought, the

¹⁷⁷*Ibidem*. ¹⁷⁸*Ibidem*.

¹⁷⁹Aristotle 2.8, 367 b. See also Pliny 2.196.

¹⁸⁰Seneca 6.12.2-3; Ammianus Marcellinus 17.7.11; Bede, *De Natura Rerum* 49. Seneca says (6.12.3) that before an earthquake in Campania the atmosphere was perfectly still for several days, although it was the winter season.

¹⁸¹68.24.2. Compare Ammianus Marcellinus 17.7.1-3 for a description of meteorological conditions before terrible earthquakes in Asia in 358 A. D.

¹⁸²2.8, 366 a. ¹⁸⁶12.3. Compare 2.27.1.

¹⁸⁴Pliny 2.129; Bede, *De Natura Rerum* 27.

¹⁸⁵W. H. Smyth, as cited in note 90, page 6.

¹⁸⁶Pliny 2.196. Compare Thoreau, the Wellfleet Oysterman, in the volume called *Cape Cod*, 116 (The Riverside Edition): "Sailors tell of 'tide-rips' and 'ground-swells,' which they suppose to have been occasioned by hurricanes and earthquakes, and to have traveled many hundred, and sometimes even two or three thousand miles".

¹⁸⁷2.4.7.

¹⁸⁸So Anaximenes believed, as we learn from Aristotle 2.7, 365 b, and Anaximander also, as quoted by Ammianus Marcellinus 17.7.12.

¹⁸⁹Compare Aristotle 2.8, 367 a.

¹⁹⁰See A. S. Pease on Cicero, *De Divinatione* 1.112 (M. Tulli Ciceronis *De Divinatione*, University of Illinois Studies in Language and Literature, VI and VIII). ¹⁹¹Compare Aristotle 2.8, 368 a.

¹⁹²A. Boscowitz, *Earthquakes*, translated from the French by C. B. Pitman, 9 (London, George Routledge and Sons, 1890). The entire second chapter, *The Forewarnings* (8-17), is pertinent to this paper.

¹⁹³For example, J. Milne, *Earthquakes 154-157* (New York, D. Appleton and Co., 1886).

¹⁹⁴Procopius tells us (6.4.29) that, when Vesuvius belches forth ashes, the country round about is sure to abound in crops.

¹⁹⁵Lydus, *De Ostentis* 53.

¹⁹⁶W. H. Smyth, as cited in note 90, page 256.

¹⁹⁷Eleventh edition, 2.81 (New York, D. Appleton and Co., 1876). ¹⁹⁸2.196.

appearance of comets, eclipses, and earthquakes¹⁹⁹. This kind of wisdom was possessed by Egyptian priests also, who claimed that the Chaldeans had acquired their astrological knowledge from them²⁰⁰. It was in Egypt that Anaxagoras learned to predict from the feel of mud in a well when stones were going to fall from heaven and when earthquakes were going to occur²⁰¹.

Astrologers devoted considerable attention to earthquakes. Many weather predictions are based upon the presence of the planets in the various signs of the zodiac. For instance, Eudoxius tells us²⁰², amid much other information about the weather, that there will be earthquakes after the moon has appeared in Taurus, Gemini, Leo, Scorpio, Sagittarius, or Aquarius on July 20.

If it thunders by night while the moon is in Capricorn, there will be severe storms, shipwrecks, and earth tremors²⁰³. According to an anonymous work, earthquakes are to be expected when Saturn and Mars are in certain positions of the zodiac and also when the sun or the moon is eclipsed in special parts of a sign²⁰⁴.

In a thunder calendar which gives the significance of thunder for each and every day of the year, we are told that if thunder occurs on October 8 an earthquake is to be expected²⁰⁵. One should note carefully that this last item is not of universal application, but holds good only for Rome²⁰⁶. If thunder and lightning occur with the moon in Virgo, there will be an earthquake to the south and cities will be devastated²⁰⁷.

Not only are earthquakes indicated by various kinds of weather and positions of the planets; they themselves afford means of prognostication. An earthquake when the sun is in Virgo signifies that the winter will be far from dry²⁰⁸. An earthquake occurring with the sun in Leo indicates severe rains²⁰⁹. If the sun is in Sagittarius at the time of an earthquake, there will be rain violent enough to imperil cities²¹⁰; if it is in Capricorn, torrents will destroy crops²¹¹; if it is in Pisces, there will be a deluge²¹². In case an earthquake occurs from the ninth to the nineteenth of the month while the moon is in Gemini, rain will fail, and cattle will go hungry; from the twenty-fifth to the thirtieth such an event portends great storms²¹³.

An earthquake in December is an indication of some blessings, but there will be unseasonable storms²¹⁴. If there is an earthquake in June, there will be hot spells²¹⁵, but another source informs us that an earth-

quake on June 30 causes cold storms²¹⁶. After an earthquake with the moon in Taurus there will be severe droughts²¹⁷. An earthquake in the morning on the calends of September with the moon in Virgo heralds a good day²¹⁸. Astrology must have teemed with lore of this sort²¹⁹.

Modern Japanese lore seems to be just as precise in its claims²²⁰:

These are things
An earthquake brings:
At nine of the bell
They sickness foretel;
At five and seven betoken rain;
At four the sky is cleared thereby.
At six and eight comes wind again.

In the weather lore of earthquakes it is hard to separate fact from fiction. Darwin could not do it. In *The Voyage of the Beagle*²²¹ he says:

....The connection between earthquakes and the weather has been often disputed: it appears to me to be a point of great interest, which is little understood At Guayaquil, it is said that a heavy shower in the dry season is invariably followed by an earthquake. In Northern Chile, from the extreme infrequency of rain, or even of foreboding rain, the probability of accidental coincidences becomes very small; yet the inhabitants are here most firmly convinced of some connection between the state of the atmosphere and of the trembling of the ground: I was much struck by this, when mentioning to some people at Copiapó that there had been a sharp shock at Coquimbo: they immediately cried out, "How fortunate! there will be plenty of pasture there this year." To their minds an earthquake foretold rain, as surely as rain foretold abundant pasture. Certainly it did so happen that on the very day of the earthquake, that shower of rain fell, which I have described as in ten days' time producing a thin sprinkling of grass.

I have never been able to find even a short paper on the weather lore of earthquakes. I believe that my own collection is unique. Most of my items were gathered during casual reading and come from widely scattered sources.

Interest in popular meteorology never abates and the local weather savant with something new to say always finds it easy to get on the front page of a newspaper. The following paragraph is taken from a Detroit paper dated September 16, 1926:

Should there be, before the first of the year, a great volcanic eruption anywhere on the surface of the globe, he predicts the northeastern United States may expect... a general snowstorm about the middle of next June, a killing frost the latter part of that month, an ice-building freeze the night of July 4, and another equally intense early in August.

My last three papers on popular meteorology have had to do with weather portended by the conditions and conduct of celestial bodies, although I did come down to earth to discuss the lore of earthquakes. In a future paper I hope to list the signs derived from thunder and lightning and to include with them some of the traditional weather lore of the winds.

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EUGENE S. MCCARTNEY

¹⁹⁹Diodorus 2.30.5. ²⁰⁰Diodorus 1.81.5-6.

²⁰¹Ammianus Marcellinus 22.16.22. On the prediction of earthquakes from the taste of water in wells see Pease on Cicero, *De Divinatione* 1.112 (volume 6, page 203, of the work cited in note 190).

²⁰²Catalogus Codicum Astrologorum Graecorum, 7.183-187 (see note 58, above).

²⁰³Lydus, *De Ostentis* 39.

²⁰⁴See pages 172-175 of C. Wachsmuth's edition of Lydus, *De Ostentis* (see note 156, above).

²⁰⁵Diarium Tonitruale Secundum P. Nigidium Figulum, as quoted by Lydus, *De Ostentis* 31.

²⁰⁶See Lydus, *De Ostentis* 38, ad finem.

²⁰⁷Catalogus Codicum Astrologorum Graecorum, 8, Part 3, 167.

²⁰⁸Lydus, *De Ostentis* 56. ²⁰⁹*Ibidem*. ²¹⁰Lydus, *De Ostentis* 57.

²¹¹Lydus, *De Ostentis* 58. ²¹²*Ibidem*. ²¹³Lydus, *De Ostentis* 18.

²¹⁴Catalogus Codicum Astrologorum Graecorum, 4.130.

²¹⁵*Ibidem*, 8, Part 3, 169.

²¹⁶*Ibidem*, 184. ²¹⁷*Ibidem*, 195.

²¹⁸*Ibidem*, 186. ²¹⁹See also *ibidem*, 7.167-173.

²²⁰Lean, II, Part I, 325.

²²¹372 (Volume 29 in *The Harvard Classics*). See also 373 and the bibliographical references in the note on 372.



Clouds, Rainbows, Weather Galls, Comets, and Earthquakes as Weather Prophets in Greek and Latin Writers (Concluded)

Author(s): Eugene S. McCartney

Source: *The Classical Weekly*, Vol. 23, No. 2 (Oct. 14, 1929), pp. 11-15

Published by: [Classical Association of the Atlantic States](#)

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... Better be a poor honest barber with a good conscience, and time to repent of my sins upon my death-bed, than be cut off (God bless us) by a musket shot, as it were in the very flower of one's age, in the pursuit of riches and fame. What signify riches, my dear friend? do they not make unto themselves wings? as the wise man saith; and does not Horace observe, *Non domus et fundus, non aeris acervus et auri Aegroti domini deduxit corpore febres, Non animo curas?*....¹³

In Chapter XVII, Random, who is minded to join the English navy, is being examined in Surgeons' Hall. Two of the examiners get into a dispute over a medical matter. One asserted that there was very good authority for the view he held (111).

... Here he was interrupted by the other, with "Sir, excuse me, I despise all authority. *Nullius in verba*! I stand upon my own bottom."....

In Chapter XLV, page 325, a certain physician discusses the meanings of the English verb 'drink', and those of Latin *bibere* and *potare* and Greek "*pinein* or *potecin*". Random comments thus (326):

... I could not help smiling at this learned and important investigation; and, to recommend myself the more to my new acquaintance, whose disposition I was by this time well informed of, I observed, that what he alleged did not, to the best of my remembrance, appear in the writings of the ancients; for Horace uses the words *poto* and *bibo* indifferently for the same purpose, as in the twentieth ode of his first Book:

Vile potabis modicis Sabinum cantharis,—
—et proelo domitam Caleno tu bibes uvam....¹⁵
(To be concluded) CHARLES KNAPP

CLOUDS, RAINBOWS, WEATHER GALLS, COMETS, AND EARTHQUAKES AS WEATHER PROPHETS IN GREEK AND LATIN WRITERS

(Concluded from page 8)

THE RAINBOW

The appearance of a rainbow or the drawing of water by a rainbow meant rain or wind¹¹¹. The bow is called *imbriifer*¹¹², and *pluvius*¹¹³. It is frequently referred to as 'drinking' water¹¹⁴. A story was created to the effect that Iris had the head of a bull and drank up the waters of rivers¹¹⁵. The threat conveyed by the bow was not the same for every quarter in which it showed itself¹¹⁶.

If it rises toward the south, it will bring a heavy fall. The rain in that quarter, such is its force, cannot be mastered by the strongest midday sun. If it shine toward the west, there will be only a dew or a light rain. If it rise in the east or thereabouts, it prognosticates fine weather¹¹⁷.

In our own lore a rainbow in the west betokens wet weather; one in the east betokens dry weather¹¹⁸.

¹¹¹Horace, *Epistulae* 1. 2. 47-49. Note that Smollett twice gives *aul* instead of *el*; he was quoting from memory, no doubt, and was tricked by his memory, as many another was before him and has been since his times.

¹¹²Horace, *Epistulae* 1.1.14. Horace's exact words are (13-15). *Ac ne forte roges quo me duce, quo lare tuter, nullius addictus iurare in verba magistri, quo me cumque rapit tempestas deferor hospes.* ¹¹³Horace, *Carmina* 1.20.1-2, 9-10.

¹¹⁴W. E. Leonard, *The Fragments of Empedocles*, 35. Fragment 50 (Chicago, The Open Court Publishing Co., 1908). See also Martial 12.29.6; Ovid, *Metamorphoses* 1. 270-271.

¹¹⁵Statius 9.405. ¹¹⁶Horace, *Ars Poetica* 18.

¹¹⁷Vergil, *Georgics* 1.380-381. *Bibit ingens arcus; Plautus, Curculio* 133 *Ecce autem bibit arcus!* Pluet, credo, hercle hodie; Lucan 4.80-82; Propertius 3.5.32.

¹¹⁸Plutarch, *Moralia* 804 B. ¹¹⁹Seneca 1.6.1.

¹²⁰Seneca 1.6.2 (J. Clarke's translation).

¹²¹D. L. Thomas and L. B. Thomas, *Kentucky Superstitions*, Nos. 2613, 2614 (Princeton University Press, 1920).

The rainbow is either solar or lunar¹¹⁹. Aristotle¹²⁰ tells us that it was formerly thought that there were no lunar rainbows. If there was to be one, it had to be at (or near) full moon, and then only as the moon was rising or setting. For this reason, he explains¹²¹, there had been only two lunar rainbows in more than fifty years. Rainbows were less frequent in summer than in winter¹²².

The double rainbow is a sign of rain¹²³. Many rainbows mean a long-continued rain¹²⁴. Rainbows occurring together signify storm after clear weather or clear weather after storm¹²⁵, but Pliny¹²⁶, owing to their frequency, does not regard rainbows as being of significance and says that they do not portend, with certainty, either rainy or clear days. Aristotle tells us that there are never more than two rainbows at the same time¹²⁷. "Three rainbows or more are not found because even the second is fainter, so that the third can have no strength whatever and cannot reach the sun at all"¹²⁸.

A despatch from Boston to the New York Times, dated December 23, 1925, and printed on December 24, says in part:

With the strong wind that drove the rain clouds of the past few days seaward there appeared today three suns and five rainbows, which turned the sky into a bank of colored clouds. The sun was surrounded by two circular rainbows, whose colors were augmented by three half circular ones, all aiding in producing a beautiful mass. In the midst of these, at various angles, appeared two other suns which, with the real one, gave the optical impression that more than one sun appeared....

According to the meteorologists these 'spots' and rainbows have no particular significance. Old school weather prophets, however, insist that they point to a long hard winter.

Rainbows may occur when oars are raised out of the sea or even around lamps¹²⁹. A rainbow seen around or through a lamp signifies rain from the south¹³⁰.

Rainbow lore is used with pleasing effect by Quintus Smyrnaeus (1.62-69)¹³¹:

Then joyed Troy's folk, despite past agonies,
As when, far-gazing from a height, the hinds
Behold a rainbow spanning the wide sea,
When they be yearning for the heaven-sent shower,
When the parched fields be craving for the rain;
Then the great sky at last is overgloomed,
And men see that fair sign of coming wind
And imminent rain, and seeing, they are glad
Who for their corn-fields' plight sore sighed before.

An oft-quoted modern rhyme is the following¹³²:

The rainbow in the morning
Is the shepherd's warning
To carry his coat on his back;
The rainbow at night
Is the shepherd's delight,
For then no coat will be lack.

¹¹⁹Seneca 1.10.

¹²⁰*Meteorologica* 3.2, 372. See also Seneca 1.3.1.

¹²¹*Meteorologica* 3.2, 372. ¹²²Bede, *De Natura Rerum* 31.

¹²³Aratus 940; *Geoponica* 1.3.5. Compare Pliny 18.353.

¹²⁴Th. 22.

¹²⁵Lydus, *De Ostentis* 9 d. page 27 of C. Wachsmuth's edition (Leipzig, Teubner, 1897). For a figurative use of the weather lore of rainbows see Ammianus Marcellinus 20.11.130.

¹²⁶2.150. ¹²⁷*Meteorologica* 3.2, 371 b. See also Pliny 2.151.

¹²⁸*Meteorologica* 3.5, 375 b. ¹²⁹*Ibidem*, 3.4, 374 a. ¹³⁰Th. 13.

¹³¹A. S. Way's translation. ¹³²Marvin, 206.

If the green be large and bright in the rainbow, it is a sign of continued rain. If red be the strongest colour, there will be rain and wind together. After much wet weather the rainbow indicates a clearing up. If the bow disappears all at once, there will follow serene and settled weather. The bow in the morning, rain will follow; if at noon, heavy rain; if at night, fair weather. The appearance of double or triple bows indicates fair weather for the present, but heavy rains soon¹³³.

Several weather maxims derived from the rainbow are dependable¹³⁴. Scientific explanations for their reliability have been given by Mr. Wm. J. Humphreys (33-36), but they are too long to be quoted here.

WEATHER GALLS (Πάβοι, Virgae)

There are seen in the sky at times 'small fragmentary appearances'¹³⁵ which the Greeks called *πάβοι*, 'rods', a term which the Romans translated by *virgae*. They are incomplete¹³⁶ or secondary rainbows. They are popularly known as weather-galls, water-galls, weather-gaws, wind-galls, wind-dogs.

Mock suns and rods are always seen by the side of the sun, not above or below it nor in the opposite quarter of the sky. They are not seen at night but always in the neighbourhood of the sun, either as it is rising or setting but more commonly towards sunset¹³⁷.

'Rods' were regarded by the Greeks as a sign of rain, but less certain than mock suns¹³⁸. When they were seen in the south, they were more dependable indications than when they were seen in the north¹³⁹. The Romans looked upon them as being just as sure signs of rain as rainbows¹⁴⁰. Eustathius¹⁴¹ says of those seen in the clouds in the morning that they signify severe storms and squalls or some other disturbance of the heavens.

Since modern weather lore of secondary rainbows is scattered I am giving several examples. In *The Rape of Lucrece* (1586-1589) Shakespeare writes:

And round about her tear-distained eye
Blue circles stream'd, like rainbows in the sky:
These water-galls in her dim element
Foretell new storms to those already spent.

The weather's taking up now,
For yonder's the weather gaw;
How bonny is the east now!
Now the colors fade awa'¹⁴².

A weather-gall at morn, fine weather all gone;
A rainbow towards night, fair weather in sight.
Rainbow at night, sailor's delight;
Rainbow in morning, sailors take warning¹⁴³.

"It will not soften into rain alone", said Minna;
"see how much heavier the clouds fall every moment,
and see these weather-gaws that streak the lead-
coloured mass with partial gleams of faded red and
purple"¹⁴⁴.

¹³³Inwards, 136.

¹³⁴Current adages may be found in Bergen, 109; Dunwoody, 70-71; Inwards, 134-137; Marvin, 205-206; Lean, 1.406; Swainson, 194-198; Thomas, Nos. 2610-2615; Vernon, 52-54; H. Gaidoz et E. Rolland, *L'Arc-en-Ciel*, Melusine 2.9-18. (Melusine is the name of a French periodical, somewhat like Folk-Lore).

¹³⁵Aristotle 3.4, 374 a.

¹³⁶*imperfecti arcus*, Seneca 1.9.1.

¹³⁷Aristotle 3.2, 372 a.

¹³⁸Aristotle, 3.6, 377 b. ¹³⁹Th. 11.

¹⁴⁰Seneca 1.9.1.

¹⁴¹Eustathii Hexaemeri Metaphrasis, 6.4 (Migne, *Patrologia Latina*, 53.925; see also *Patrologia Graeca*, 18.720).

¹⁴²A Scotch rhyme quoted by Marvin, 206.

¹⁴³An English nautical rhyme quoted by Marvin, 206.

¹⁴⁴Scott, *The Pirate*, Chapter 4.

It seems worth while to quote here three figurative references by Horace Walpole to the weather-gall: "False good news are always produced by true good, like the watergall by the rainbow"¹⁴⁵; "...but what signifies repeating the faint efforts of an old watergall opposed to its own old sun"¹⁴⁶; "Thank heaven it is complete, and did not remain imperfect like a water-gall"¹⁴⁷.

COMETS

As a rule the appearance of a comet signified wind, but, if there were many of them, drought also¹⁴⁸. Under some conditions comets portended cold¹⁴⁹. There were supposed to bring rain storms too¹⁵⁰.

Even Aristotle¹⁵¹ was under the influence of the popular weather lore of comets:

So when there are many comets and they are dense, it is as we say, and the years are clearly dry and windy. When they are fewer and fainter this effect does not appear in the same degree, though as a rule the wind is found to be excessive either in duration or strength. For instance when the stone at Aegospotami fell out of the air—it had been carried up by a wind and fell down in the daytime—then too a comet happened to have appeared in the west. And at the time of the great comet¹⁵² the winter was dry and north winds prevailed, and the wave was due to an opposition of winds. For in the gulf a north wind blew and outside it a violent south wind. Again in the archonship of Nicomachus¹⁵³ a comet appeared for a few days about the equinoctial circle (this one had not risen in the west), and simultaneously with it there happened the storm at Corinth.

Seneca warns¹⁵⁴

'that the rising of a comet does not convey a threat of wind and rain in the immediate future, as Aristotle says, but casts suspicion over the whole year. Hence it is plain that the comet has not derived prognostications from its immediate surroundings to reveal for the immediate future, but that it has them stored up and buried deep within by the laws of the universe. The comet which appeared in the consulship of Paterculus and Vopiscus fulfilled the anticipations of this kind entertained by Aristotle, and for that matter by Theophrastus; for there were everywhere severe and prolonged storms, while in Achaia and Macedonia cities were overturned by earthquakes'.

The comet called *lampas* ('torch'), when it appeared in the east, involved all the lands of the Orient in misty weather injurious to crops; in the south, it caused Africa to struggle with drought and a plague of snakes; in the west, it brought to Italy continual overflowing of the streams; in the north, it meant hunger for people living in that quarter¹⁵⁵. The comet *lampadias* ('torch-bearer'), when turned toward the east, portended for Persia and Syria drought, thunderbolts, destruction of crops, and the burning of palaces¹⁵⁶. The Chaldeans believed that comets as well as both lunar and solar eclipses signified wind, rain, and terrible heat¹⁵⁷.

¹⁴⁵The Letters of Horace Walpole, Earl of Orford, edited by Peter Cunningham, 1.310 (London, Henry G. Bohn, 1861).

¹⁴⁶*Ibidem*, 6.187. ¹⁴⁷*Ibidem*, 6.1.

¹⁴⁸Th. 34; Aratus 1091-1093; Aristotle 1.7, 344 b; Pl. 2.91; Bede, *De Natura Rerum* 24; Claudian, *Proserpina* 1.233.

¹⁴⁹Th. 57. ¹⁵⁰Seneca 7.28.1; Claudian, *De Bello Gildonico* 15.496.

¹⁵¹*Meteorologica* 1.7, 344 b.

¹⁵²373-372 B. C. ¹⁵³341-340 B. C. ¹⁵⁴7.28.2.

¹⁵⁵Servius on Vergil, *Aeneid* 10.272.

¹⁵⁶See C. Wachsmuth's edition of Ioannis Laurentii Lydi *Liber de Ostentis et Calendaria Graeca Omnia*, page 168 (Leipzig, Teubner, 1897).

¹⁵⁷Diodorus 2.30.5.

If it thundered on May 27 or 28 in the neighborhood of Rome, there would be signs from heaven and a comet would shine forth¹⁵⁸.

Homer¹⁵⁹ speaks of a star which he calls a bad sign for sailors and for armies. Since comets bring bad weather and also war and disasters, this star may have been a comet.

It is probable that the reference in Lydus, *De Ostentis* 4, is to meteors¹⁶⁰. It is there stated that stars coursing from the north or the south signify the rising of strong winds; if one comes from the north, making furrows of fire, it is a sign of thunder, thick air and a stronger wind from the north; if one come from the south, the south wind will blow.

Aristotle¹⁶¹ refutes the statement that comets appear only in the north and at the time of the summer solstice. Seneca¹⁶² sees no basis for the belief that they occur only in conjunction with wind, arguing that, if they arose with the wind, they would gain strength with it, and would wane as the wind abated.

A few other examples of the weather lore of comets are to be found in *THE CLASSICAL WEEKLY* 20.46.

Even at the present time "Comets are said to bring cold weather"¹⁶³. "In France comets are thought to improve the grape crop, and wine that is made during the year of their appearance is called 'Comet Wine' "¹⁶⁴. . . . The comet of 1811 obtained in Western Europe, and especially in Great Britain, fame of a very un-astronomical character. Its year of appearance was also the year of an unusually celebrated port wine vintage in Portugal, and 'Comet Wine' figured for a long period of years, first of all in the price-lists of wine merchants, and afterwards in the cellar books of many private houses, and finally in the advertisements of auction sales¹⁶⁵.

Any unusual weather that prevails while a comet is visible is naturally connected with the comet. To Halley's Comet, for instance, have been ascribed cold, drought, rains, floods, and earthquakes¹⁶⁶. A newspaper clipping I saved in 1921 tells how the hot, rainless weather of the summer of that year was attributed to a comet. The association of comets with heat is widespread¹⁶⁷.

That hot years have in general more comets than cold ones is very true, and for the simple reason that hot years giving clear skies are more favourable for the discovery of comets than cold years, which so often mean cloudy skies¹⁶⁸.

EARTHQUAKES

It may seem a little incongruous to the reader for me to include earthquakes in this paper, but weather lore, like politics, makes strange bedfellows. In ancient superstition comets and earthquakes are very frequently mentioned in the groups of portents that occurred just before dire calamities. A better justification, perhaps, is the fact that Aristotle in his *Meteoro-*

logica¹⁶⁹ discusses the causes and significance of earthquakes.

In this section of my paper I desire to put modern lore first and to quote two picturesque passages from Bret Harte's stories:

One night it was very warm; the usual trade-winds had died away before sunset, leaving an unwonted hush in sky and plain. There was something so portentous in this sudden withdrawal of that rude stimulus to the otherwise monotonous level that a recurrence of such phenomena was always known as 'earthquake weather.' The wild cattle moved uneasily in the distance without feeding; herds of unbroken mustangs approached the confines of the hacienda in vague timorous squads. The silence and stagnation of the old house was oppressive, as if the life had really gone out of it at last. . . .¹⁷⁰

"Well, this yer earthquake was ten years ago, just after I came. I reckon I oughter remember it. It was a queer sort o' day in the fall, dry and hot as if thar might hev bin a fire in the woods, only thar was n't no wind. Not a breath of air anywhar. The leaves of them alders hung straight as a plumb-line. Except for that thar stream and that thar wheel, nothin' moved. Thar was n't a bird on the wing over that cañon; thar was n't a squirrel skirmishin' in the hull wood; even the lizards in the rocks stiffened like stone Chinese idols. It kept gettin' quieter and quieter, until I walked out on that ledge and felt as if I'd have to give a yell just to hear my own voice. Thar was a thin veil over everything, and betwixt and between everything, and the sun was rooted in the middle of it as if it could n't move either. Everythin' seemed to be waitin', waitin', waitin'. Then all of a suddin suthin' seemed to give somewhar! Suthin' fetched away with a queer sort of rumblin', as if the peg had slipped under creation"¹⁷¹.

Were Aristotle to come back to-day with a knowledge of English, there would be absolutely nothing strange to him in the meteorology of these passages. He might in fact claim that Bret Harte had stolen not his thunder but his earthquakes. Aristotle says¹⁷² that "most earthquakes and the greatest are accompanied by calm", although some are attended by wind. During the day earthquakes occur most frequently about noon, since that is the calmest part of the day, but most of them and the severest take place at night, because the night is calmer than the day¹⁷³.

Aristotle's theory¹⁷⁴ is that wind is generated by the evaporation of moisture through the heat of the sun or the earth's own fire, and that this wind flows sometimes outwards, sometimes inwards, and sometimes is divided. Since earthquakes occur when, to use Shakespeare's words¹⁷⁵,

the teeming earth
Is with a kind of colic pinch'd and vex'd
By the imprisoning of unruly wind
Within her womb; which, for enlargement striving,
Shakes the old beldam earth and topples down
Steeple and moss-grown towers,

it follows that the calm "must be most marked before the more violent earthquakes, for when the wind is not part outside the earth, part inside, but moves in a single body, its strength must be greater"¹⁷⁶.

¹⁵⁸See Lydus, *De Ostentis* 38. ¹⁵⁹*Iliad* 4.75-76.

¹⁶⁰The discussion of comets proper is postponed to Sections 10-15.

¹⁶¹1.6, 343 a. ¹⁶²7.7.1. ¹⁶³Inwards, 77. ¹⁶⁴Marvin, 207.

¹⁶⁵G. F. Chambers, *The Story of the Comets*², 142 (Oxford: At the Clarendon Press, 1910).

¹⁶⁶James C. Watson, *A Popular Treatise on Comets*, 31-33 (Philadelphia, James Challen and Son, 1861). See also 34-35.

¹⁶⁷Chambers, as cited in note 165, page 234.

¹⁶⁸*Ibidem*, 235.

¹⁶⁹2.7, 365 a - 2.8, 369 a.

¹⁷⁰*The Mystery of the Hacienda, The Writings of Bret Harte, 10.150-151* (Boston and New York, Houghton Mifflin Co., 1906).

¹⁷¹In a Hollow of the Hills, *ibidem*, 10.42-43.

¹⁷²2.8, 366 a. ¹⁷³*Ibidem*, 1742.8, 365 b.

¹⁷⁴Henry the Fourth, Part I, 3.1. 28-33. ¹⁷⁵2.8, 367 a.

Both calm and sharp frost sometimes precede earthquakes at sunrise¹⁷⁷. "The cold comes because the evaporation which is naturally and essentially hot enters the earth"¹⁷⁸.

There is another sign which is seen in fine weather either by day or a little after sunset. It is "a little, light, long-drawn cloud...like a long very straight line. This is because the wind is leaving the air and dying down"¹⁷⁹.

The idea that there was a lull or calm just before earthquakes was repeated time and again by Greek and Latin writers¹⁸⁰, and I see no reason why this tradition should not have come down to modern times unbroken. Some of the weather lore in old New England almanacs can be traced back through English books on husbandry to Aratus and Theophrastus.

Cassius Dio¹⁸¹ tells us that an earthquake at Antioch in 115 A. D. was preceded by winds and many thunderbolts. Aristotle says¹⁸²: "It is true that some take place when a wind is blowing, but this presents no difficulty. We sometimes find several winds blowing simultaneously. If one of these enters the earth we get an earthquake attended by wind. Only these earthquakes are less severe because their source and cause is divided". Seneca¹⁸³ notes that two winds have sometimes been blowing during earthquakes. After south winds have been blowing, earthquakes are especially dangerous¹⁸⁴.

In speaking of the climate of Sicily a modern writer states¹⁸⁵ that the earthquakes he felt

were generally preceded by a peculiar density of the atmosphere, the winds were variable, and the waters turbid. They however frequently happen also in fine weather, when nothing remarkable is indicated by the eudiometric instruments. I have more than once experienced their effect on board a ship, and from the sudden electric nature of the shock could scarcely believe that we had not struck upon an unknown shoal. Ancient sailors likewise felt earthquakes at sea¹⁸⁶.

Pausanias¹⁸⁷ gives an excellent summary of ancient views regarding conditions prior to earthquakes:

Ominous signs, vouchsafed by the god <Poseidon>, foretell the approach of great and far-reaching earthquakes. The nature of the signs is generally the same. For earthquakes are preceded either by heavy and continuous rains or long droughts¹⁸⁸. The weather, too, is unseasonable. If it is winter, the weather is sultry; if it is summer, there is a haze¹⁸⁹, and the sun's disc appears of an unusual colour, slightly inclining

either to red or dun. Springs of water mostly dry up¹⁹⁰. Sudden gusts sometimes sweep across the country, blowing the trees down. At times, too, the sky is shot with sheets of flame. Stars are seen of an aspect never known before, and strike consternation into beholders. Moreover, a mighty murmur is heard of winds blowing underground¹⁹¹. And many more signs there are whereby the god gives warning of the approach of violent earthquakes.

Most of the signs enumerated by Pausanias are still regarded by the popular mind as certain prognostics of the catastrophe, and this belief is sometimes justified by the event¹⁹².

The drying up of springs and wells before or after earthquakes has been noted by modern writers¹⁹³. According to a newspaper clipping springs fall around Vesuvius before an outburst of the mountain¹⁹⁴. One ancient authority held that in summer drought was a contributing factor to earthquakes, while in winter rain helped to cause them¹⁹⁵.

In modern times, previous to the occurrence of an earthquake in its neighborhood "Stromboli has been observed to be covered with dense clouds of smoke, and to emit, with increased activity, unusually ardent flames"¹⁹⁶.

In connection with Pausanias's list of phenomena attending earthquakes Sir James G. Frazer pertinently quotes from Sir Charles Lyell's *Principles of Geology*¹⁹⁷:

Irregularities in the seasons preceding or following the shocks; sudden gusts of wind, interrupted by dead calms; violent rains at unusual seasons, or in countries where, as a rule, they are almost unknown; a reddening of the sun's disk, and haziness in the air, often continued for months; an evolution of electric matter, or of inflammable gas from the soil, with sulphurous and mephitic vapours; noises underground, like the running of carriages, or the discharge of artillery, or distant thunder; animals uttering cries of distress, and evincing extraordinary alarm, being more sensitive than men to the slightest movement; a sensation like seasickness, and a dizziness in the head, experienced by men:—these, and other phenomena...have recurred again and again at distant ages, and in all parts of the globe.

Modern writers call attention to the restlessness of animals before earthquakes. The only classical reference I have to such a thing is one in Pliny¹⁹⁸, who observes that birds upon their perches betray alarm as earthquakes come.

According to a newspaper clipping, popular belief endows a widely distributed sensitive plant of the tropics, *Abrus Precatorius*, with the ability to predict earthquakes.

In antiquity the heavens too were studied in an effort to anticipate changes in meteorological conditions. To the Chaldeans was attributed the ability to predict wind storms, rains, severe drought, the

¹⁷⁷*Ibidem*. ¹⁷⁸*Ibidem*.

¹⁷⁹Aristotle 2.8, 367 b. See also Pliny 2.196.

¹⁸⁰Seneca 6.12.2-3; Ammianus Marcellinus 17.7.11; Bede, *De Natura Rerum* 49. Seneca says (6.12.3) that before an earthquake in Campania the atmosphere was perfectly still for several days, although it was the winter season.

¹⁸¹68.24.2. Compare Ammianus Marcellinus 17.7.1-3 for a description of meteorological conditions before terrible earthquakes in Asia in 358 A. D.

¹⁸²2.8, 366 a. ¹⁸⁶12.3. Compare 2.27.1.

¹⁸⁴Pliny 2.129; Bede, *De Natura Rerum* 27.

¹⁸⁵W. H. Smyth, as cited in note 90, page 6.

¹⁸⁶Pliny 2.196. Compare Thoreau, the Wellfleet Oysterman, in the volume called *Cape Cod*, 116 (The Riverside Edition): "Sailors tell of 'tide-rips' and 'ground-swells,' which they suppose to have been occasioned by hurricanes and earthquakes, and to have traveled many hundred, and sometimes even two or three thousand miles".

¹⁸⁷2.4.7.

¹⁸⁸So Anaximenes believed, as we learn from Aristotle 2.7, 365 b, and Anaximander also, as quoted by Ammianus Marcellinus 17.7.12.

¹⁸⁹Compare Aristotle 2.8, 367 a.

¹⁹⁰See A. S. Pease on Cicero, *De Divinatione* 1.112 (M. Tulli Ciceronis *De Divinatione*, University of Illinois Studies in Language and Literature, VI and VIII). ¹⁹¹Compare Aristotle 2.8, 368 a.

¹⁹²A. Boscowitz, *Earthquakes*, translated from the French by C. B. Pitman, 9 (London, George Routledge and Sons, 1890). The entire second chapter, *The Forewarnings* (8-17), is pertinent to this paper.

¹⁹³For example, J. Milne, *Earthquakes 154-157* (New York, D. Appleton and Co., 1886).

¹⁹⁴Procopius tells us (6.4.29) that, when Vesuvius belches forth ashes, the country round about is sure to abound in crops.

¹⁹⁵Lydus, *De Ostentis* 53.

¹⁹⁶W. H. Smyth, as cited in note 90, page 256.

¹⁹⁷Eleventh edition, 2.81 (New York, D. Appleton and Co., 1876). ¹⁹⁸2.196.

appearance of comets, eclipses, and earthquakes¹⁹⁹. This kind of wisdom was possessed by Egyptian priests also, who claimed that the Chaldeans had acquired their astrological knowledge from them²⁰⁰. It was in Egypt that Anaxagoras learned to predict from the feel of mud in a well when stones were going to fall from heaven and when earthquakes were going to occur²⁰¹.

Astrologers devoted considerable attention to earthquakes. Many weather predictions are based upon the presence of the planets in the various signs of the zodiac. For instance, Eudoxius tells us²⁰², amid much other information about the weather, that there will be earthquakes after the moon has appeared in Taurus, Gemini, Leo, Scorpio, Sagittarius, or Aquarius on July 20.

If it thunders by night while the moon is in Capricorn, there will be severe storms, shipwrecks, and earth tremors²⁰³. According to an anonymous work, earthquakes are to be expected when Saturn and Mars are in certain positions of the zodiac and also when the sun or the moon is eclipsed in special parts of a sign²⁰⁴.

In a thunder calendar which gives the significance of thunder for each and every day of the year, we are told that if thunder occurs on October 8 an earthquake is to be expected²⁰⁵. One should note carefully that this last item is not of universal application, but holds good only for Rome²⁰⁶. If thunder and lightning occur with the moon in Virgo, there will be an earthquake to the south and cities will be devastated²⁰⁷.

Not only are earthquakes indicated by various kinds of weather and positions of the planets; they themselves afford means of prognostication. An earthquake when the sun is in Virgo signifies that the winter will be far from dry²⁰⁸. An earthquake occurring with the sun in Leo indicates severe rains²⁰⁹. If the sun is in Sagittarius at the time of an earthquake, there will be rain violent enough to imperil cities²¹⁰; if it is in Capricorn, torrents will destroy crops²¹¹; if it is in Pisces, there will be a deluge²¹². In case an earthquake occurs from the ninth to the nineteenth of the month while the moon is in Gemini, rain will fail, and cattle will go hungry; from the twenty-fifth to the thirtieth such an event portends great storms²¹³.

An earthquake in December is an indication of some blessings, but there will be unseasonable storms²¹⁴. If there is an earthquake in June, there will be hot spells²¹⁵, but another source informs us that an earth-

quake on June 30 causes cold storms²¹⁶. After an earthquake with the moon in Taurus there will be severe droughts²¹⁷. An earthquake in the morning on the calends of September with the moon in Virgo heralds a good day²¹⁸. Astrology must have teemed with lore of this sort²¹⁹.

Modern Japanese lore seems to be just as precise in its claims²²⁰:

These are things
An earthquake brings:
At nine of the bell
They sickness foretel;
At five and seven betoken rain;
At four the sky is cleared thereby.
At six and eight comes wind again.

In the weather lore of earthquakes it is hard to separate fact from fiction. Darwin could not do it. In *The Voyage of the Beagle*²²¹ he says:

....The connection between earthquakes and the weather has been often disputed: it appears to me to be a point of great interest, which is little understood At Guayaquil, it is said that a heavy shower in the dry season is invariably followed by an earthquake. In Northern Chile, from the extreme infrequency of rain, or even of foreboding rain, the probability of accidental coincidences becomes very small; yet the inhabitants are here most firmly convinced of some connection between the state of the atmosphere and of the trembling of the ground: I was much struck by this, when mentioning to some people at Copiapó that there had been a sharp shock at Coquimbo: they immediately cried out, "How fortunate! there will be plenty of pasture there this year." To their minds an earthquake foretold rain, as surely as rain foretold abundant pasture. Certainly it did so happen that on the very day of the earthquake, that shower of rain fell, which I have described as in ten days' time producing a thin sprinkling of grass.

I have never been able to find even a short paper on the weather lore of earthquakes. I believe that my own collection is unique. Most of my items were gathered during casual reading and come from widely scattered sources.

Interest in popular meteorology never abates and the local weather savant with something new to say always finds it easy to get on the front page of a newspaper. The following paragraph is taken from a Detroit paper dated September 16, 1926:

Should there be, before the first of the year, a great volcanic eruption anywhere on the surface of the globe, he predicts the northeastern United States may expect... a general snowstorm about the middle of next June, a killing frost the latter part of that month, an ice-building freeze the night of July 4, and another equally intense early in August.

My last three papers on popular meteorology have had to do with weather portended by the conditions and conduct of celestial bodies, although I did come down to earth to discuss the lore of earthquakes. In a future paper I hope to list the signs derived from thunder and lightning and to include with them some of the traditional weather lore of the winds.

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¹⁹⁹Diodorus 2.30.5. ²⁰⁰Diodorus 1.81.5-6.

²⁰¹Ammianus Marcellinus 22.16.22. On the prediction of earthquakes from the taste of water in wells see Pease on Cicero, *De Divinatione* 1.112 (volume 6, page 203, of the work cited in note 190).

²⁰²Catalogus Codicum Astrologorum Graecorum, 7.183-187 (see note 58, above).

²⁰³Lydus, *De Ostentis* 39.

²⁰⁴See pages 172-175 of C. Wachsmuth's edition of Lydus, *De Ostentis* (see note 156, above).

²⁰⁵Diarium Tonitruale Secundum P. Nigidium Figulum, as quoted by Lydus, *De Ostentis* 31.

²⁰⁶See Lydus, *De Ostentis* 38, ad finem.

²⁰⁷Catalogus Codicum Astrologorum Graecorum, 8, Part 3, 167.

²⁰⁸Lydus, *De Ostentis* 56. ²⁰⁹*Ibidem*. ²¹⁰Lydus, *De Ostentis* 57.

²¹¹Lydus, *De Ostentis* 58. ²¹²*Ibidem*. ²¹³Lydus, *De Ostentis* 18.

²¹⁴Catalogus Codicum Astrologorum Graecorum, 4.130.

²¹⁵*Ibidem*, 8, Part 3, 169.

²¹⁶*Ibidem*, 184. ²¹⁷*Ibidem*, 195.

²¹⁸*Ibidem*, 186. ²¹⁹See also *ibidem*, 7.167-173.

²²⁰Lean, II, Part I, 325.

²²¹372 (Volume 29 in *The Harvard Classics*). See also 373 and the bibliographical references in the note on 372.



Greek and Roman Weather Lore of Winds

Author(s): Eugene S. McCartney

Reviewed work(s):

Source: *The Classical Weekly*, Vol. 24, No. 2 (Oct. 13, 1930), pp. 11-16

Published by: [Classical Association of the Atlantic States](#)

Stable URL: <http://www.jstor.org/stable/4389493>

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something to say in THE CLASSICAL WEEKLY 16.185-186, 18.169, 22.153. Whether he realizes it or not, he is far more concerned with presenting, as a text, something different than he is in keeping his feet on the ground or his head out of the clouds. The following passage in his Preface (v-vi) seems to me a most naïve bit of self-revelation:

In preparing the text I have discarded much of my earlier work, in the belief, shared no doubt by many scholars, that the discovery of papyrus fragments of ancient Greek books has shifted the editor's bearings from Constantinople to Alexandria. With the 'doctrine of the normal line,' exploded by A. C. Clark <where and when, one may fairly ask>, went much critical lumber, and the dust is only just beginning to clear. The peculiar character of this text, with its recurring *kal* and its natural toleration of displacement, makes it an excellent *corpus vile* to experiment on. It would be too much to hope that my readers will come away from my Introduction as confident as I am that our MSS. go back to an 11-letter line archetype, but I cannot help feeling that there is a plausibility in the emendations I have based upon my hypothesis which is not to be found in the others.

Mr. Edmonds's way of editing seems to me the last way in the world likely to attain the truth.

Mr. Knox gives a Preface (iii-vi), General Introduction (xi-xxvi), special Introductions to the authors whose work is represented in this volume, text of those authors and translations (2-353), Addenda (354-358), Index I—Proper Names (359-363), Index II—Doubtful, Unusual, or Corrupt Words and Uses (364-365).

(10) Cicero, The Letters to his Friends, III, Including the Letters to Quintus (the last of three volumes). By W. Glynn Williams (1929). Pp. xxviii + 622.

For a notice of Volumes I-II of Mr. Williams's translation of Cicero, *Ad Familiares*, see THE CLASSICAL WEEKLY 22.161.

Volume III contains an Introduction (ix-xi), A Chronological Summary of the Principal Events in the Life of Cicero (xii-xxviii), Cicero's Letters to his Friends, Books XIII-XVI, Text and Translation (2-381), Cicero's Letters to his Brother Quintus, Text and Translation (385-611), Index of Names I.: Cicero's Letters to his Friends, Books XIII-XVI (612-617), Index of Names II.: Cicero's Letters to Quintus (618-622). The pitifully meager Introduction (ix-xi) is identical with that given in Volume I (see THE CLASSICAL WEEKLY 22.161). Prefixed to the text and translation of the letters to Quintus is A Short Life of Quintus Tullius Cicero (385-387).

As a specimen of Mr. Williams's work as a translator I give his version of *Ad Familiares* 14.4.1-6 (pages 195, 197, 199). The passage, which is part of a letter written by Cicero at Brundisium, during his exile, on April 29, 58 B. C., should be of deep interest to all readers of THE CLASSICAL WEEKLY.

CICERO TO TERENTIA AND HIS FAMILY

Yes, I do send you a letter less often than I might, because, while every hour of my life is a misery to me, yet, when I either write to you, or read a letter from any of you, I am so overcome with weeping that I cannot bear it. Would that I had been less eager to live! At any rate I should have seen no sorrow, or not

much of it, in my life. But if fortune has in reserve for me any hope at all of getting back any benefit at any time, the mistake I made is not so serious; if, however, these ills can never be removed, I assure you, my dearest, that my desire is to see you as soon as possible and die in your arms, since neither the gods, whom *you* have so virtuously worshipped, nor the men, whom *I* have ever served, have shown us any gratitude.

I have been for thirteen days at Brundisium, at the house of M. Laenius Flaccus, an excellent man, who has shown no thought for his fortunes and civil status as compared with my safety, and has not been deterred by the penalty of a most scandalous law from fulfilling the claims and duties of hospitality and friendship. I pray that I may some day be able to show my gratitude to him,—a gratitude I shall never cease to feel.

I set out from Brundisium on April 29th. I am making for Cyzicus through Macedonia. Ruined, alas, and prostrate as I am, why should I now ask you to come here, you, an invalid lady, exhausted in mind and body? Should I not ask you? Am I then to be without you? This, I think, is what I shall plead—if there is any hope of my return, encourage it and assist the matter; but if, as I fear, it is over and done with, make every effort to come here in any way you can. This one thing I would have you know—if I have you, I shall not think that I am absolutely lost. But what will become of my dearest Tullia? It is now for you to see to that; I have no suggestion to make. But in any case, however matters turn out, we must do all we can for that poor little damsel's matrimonial settlement and reputation. Again, what will my boy Cicero do? *He* I hope may always be in my bosom and between my arms. I cannot now write more; grief stays my pen. How you have fared I know not,—whether you retain anything or have been, as I fear, utterly despoiled.

Piso will, as you write, always, I hope, be our friend. As to the liberation of the slaves, there is nothing to upset you. In the first place yours have been promised that you will act as each of them severally deserves. Orpheus so far is doing his duty, nobody else in any marked degree. As regards the other slaves the arrangement is this: that if my estate passed out of my hands they were to be my freedmen, provided they could make good this claim; but if the estate still remains in my hands, that they should continue to be my slaves, with the exception of an extremely small number. But these are minor points.

As to your exhorting me to be of good courage and not to abandon the hope of recovering my civil rights, I could only wish that matters were such as to justify the hope. As it is, poor wretch, when shall I at last get a letter from you? Who will bring it me? I should have awaited one at Brundisium, had the sailors allowed it, but they did not want to miss the favourable weather. For the rest, bear up, Terentia mine, with all the dignity you can. We have lived; we have had our day. It was not our failings, but our virtues, that laid us low; I am guilty of no wrong, except that I did not forfeit my life when I forfeited my honours. But if my children preferred that I should live, let us bear all else, unbearable though it be. But there—I, who am encouraging you, cannot encourage myself.

(To be Concluded)

CHARLES KNAPP

Greek and Roman Weather Lore of Winds

In a recent biography of Lincoln there is to be found a list of weather signs and superstitions that were familiar to the people with whom he came in contact in his youth¹. If this knowledge helps one to an understanding of Lincoln's life and character, then collections

¹Carl Sandburg, *Abraham Lincoln, The Prairie Years* 1.66-68 (New York, Harcourt, Brace and Co., 1926).

of classical weather lore should prove an aid to the appreciation of the daily life of the Greeks and the Romans.

My previous papers in *THE CLASSICAL WEEKLY*² on popular meteorology have to do with forecasts derived from objects that are tangible or visible, such as animals, plants, and heavenly bodies. In this paper I wish to gather together the lore of an element that is unsubstantial and hopelessly *varium et mutabile*—the wind³. "The wind bloweth where it listeth, and thou hearest the sound thereof, but canst not tell whence it cometh, and whither it goeth..."

In justifying the weather as a topic of conversation Emerson once said⁴: "We are pensioners of the wind. The weathercock is the wisest man. All our prosperity, enterprise, temper, come and go with the fickle air". The wind affected the material welfare of the ancients in more ways than it does ours. By its aid they caught quail in nets⁵, winnowed grain⁶, and sailed their ships⁷. Seneca states⁸ that Heaven had many purposes in view in creating the winds and sending them throughout the world, but he notes⁹ that the winds were not an unmixed blessing, since they carried Roman soldiers to distant places to war with men whom they did not hate.

Greece is a country of many mountains and with many indentations caused by arms of the sea. Both by sea and by land it created many opportunities for the caprices of a wayward and fickle wind. Italy, too, is much broken and its seacoast is irregular. There existed a close relation between the geography and the weather of these countries, as the ancients were well aware.

Aristotle¹⁰ asks why different winds are rainy in different places, and notes variations in the Aegean. He calls attention to the part played by the Hellespont and explains how mountains interfere with the freedom of clouds and cause them to condense and drop their burden^{10a}. Livy¹¹ speaks of the Cyclades as a very windy region and attributes this aspect of their weather to their being separated sometimes by wide straits, sometimes by narrow passages.

Pliny¹² knew that winding mountains broken by peaks and ridges united with hollow meandering valleys to cause winds without number. It is hardly to be wondered at, therefore, that Seneca¹³ shrinks from the task of enumerating the various winds. He says

that there is hardly any district with which there is not associated some wind that arises within it and falls not far from it.

The Greek proverb, 'Natives know best which way the wind lies'¹⁴, is in itself a sufficient commentary upon the way in which conditions changed from place to place. Only residents could become familiar with the varying aerial channels of the wind. We are informed by Theophrastus¹⁵ that signs derived from local weather seers were most trustworthy. Such village savants have been the source of much weather knowledge throughout the ages¹⁶. They may, perhaps, be typified by Cloddipole¹⁷:

From Cloddipole we learnt to read the skies
To know when hail will fall or winds arise.

DIRECTIONS AND WEATHER ASSOCIATIONS OF THE PRINCIPAL WINDS

Doubtless the vast bulk of the weather wisdom of popular meteorologists in small localities never found its way into literature, but there has survived much traditional information about the habits and the weather significance of winds that blew in certain seasons and worked weal or woe in large areas of Greece and Italy. Aristotle, Theophrastus, Pliny, and Seneca have written at length about the directions of the more prominent winds and their well-established reputations for bringing certain kinds of weather¹⁸. The saying, "Every wind has its weather", is nowhere better exemplified than in Greece and in Italy. In these lands recognition of a change of wind seems to have been almost immediate.

The orientation of the winds, according to the important Greek and Latin references to the subject, has been given in convenient form in a table compiled by Otto Gilbert, and published in his invaluable work, *Die Meteorologischen Theorien des Griechischen Altertums*¹⁹, 550-551. His entire chapter on Windsysteme, 539-584, is important.

In the various wind-roses or wind-charts constructed by modern scholars one finds minor discrepancies, a thing that is inevitable, since some at least of the ancients were unable to thread their way through the maze of conflicting statements, as is abundantly attested by Aulus Gellius²⁰. It is obvious that with migrations and intermingling of tribes and races confusion would result. Our own weather lore has

²An Animal Weather Bureau, 14.89-93, 97-100; The Folk Calendar of Times and Seasons, 16.3-7; The Plant Almanac and Weather Bureau, 17.105-108; Magic and the Weather in Classical Antiquity, 18.154-157, 163-166; The Classical Astral Weather Chart for Rustics and Seamen, 20.43-49, 51-54; Greek and Roman Weather Lore of the Sun and the Moon, 22.25-31, 33-37; Clouds, Rainbows, Weather Galls, Comets, and Earthquakes as Weather Prophets in Greek and Latin Writers, 23.2-8, 11-15.

³The following abbreviations will be used: Arist., Met. = Aristotle, *Meteorologica*; Arist., Prob. = Aristotle, *Problemata*; Bede = Bede, *De Natura Rerum*; Isidore = Isidore (Isidorus), *De Natura Rerum*; Pliny = Plinius, *Naturalis Historia*; Seneca = Seneca, *Naturales Quaestiones*; Th. = Theophrastus.

⁴I know this quotation at second hand only.

⁵Callimachus, *Aitia* 3.1 (page 209 of A. W. Mair's translation of Callimachus and Lycophron in The Loeb Classical Library).

⁶See the Greek Anthology 6.53.

⁷Pliny 2.118; Vegetius, *De Re Militari* 4.38.

⁸Seneca 5.18.1. ⁹Seneca 5.18.8-14.

¹⁰Prob. 26. 7, 56. See also Th., *De Ventis* 1.5.

^{10a}See *THE CLASSICAL WEEKLY* 23. 5, note 57, 7, note 107. C. K. >

¹¹36.43.1.

¹²2.115.

¹³5.17.4. Compare Aulus Gellius 2.22.2, 19.

¹⁴Polybius 9.25.3.

¹⁵De Signis 3.

¹⁶See, for instance, an unsigned article on Village Weather Prophets, *The Spectator* 89 (1902), 982-983.

¹⁷John Gay, *The Shepherd's Week*, Monday, 25-26.

¹⁸Arist., *Met.* 363 a - 365 a, *Prob.*, Book 26, *De Mundo* 4.364 b; Th., *De Ventis* (to be found in F. Wimmer's edition of Theophrasti *Eresii Opera Quae Supersunt Omnia*, 3.94-115 [Leipzig, Teubner, 1862]); Th., *De Signis* 26-37; Pliny 2.119-130, 18.328-339; Seneca 5.8-18. Other valuable references, though secondary, are Lydus, *De Mensibus* 4.119; Adamantios, *Περὶ Ἀνέμων* (the text is published by V. Rose, *Anecdota Graeca et Graecolatina*, *Erstes Heft*, 27-52 [Berlin, 1864]); Isidore 37, *Origines* 13.11; Gellius 2.22; Vegetius, *De Re Militari* 4.38; Vitruvius 1.63; Bede 27. Strabo 1.2.21 is interesting. Perhaps one should include the short poem *Incerti Versus De Duodecim Ventis* (in *Poetae Latini Minores*, edited by N. E. Lemaire, 4.493-498 [Paris, 1825]). Much classical lore of the winds is used in Bacon, *Historia Ventorum* (The Works of Francis Bacon, Collected and Edited by J. Spedding, R. L. Ellis, and D. D. Heath, 3.236-243, 281-291, 9.448-458 [Cambridge, Massachusetts, The Riverside Press]).

¹⁹Leipzig, Teubner, 1907.

²⁰2.22.2.

European importations and in Europe certain days still keep unchanged the weather associations they had before the calendar was modernized.

A great point of difference among modern scholars lies in the number of degrees in the sectors to be assigned to the principal winds²¹.

In an illuminating paper by Professor D'Arcy Wentworth Thompson, entitled *The Greek Winds*, in *The Classical Review* 32.49-56, corrections are made in the traditional interpretation of the wind-chart described by Aristotle, *Met.* 2.6, 363 b. Professor Thompson's division of the Greek compass-card seems to have been accepted by later writers who knew of its existence²².

The winds were closely associated with the sun. Professor Thompson shows that the directions of the winds listed by Aristotle were determined directly or indirectly by the positions at various periods²³ of the rising and the setting sun. East and west winds come, of course, from the directions of the equinoctial rising and setting of the sun; north and south winds come from the directions ascertained by cutting the east and west line at right angles. Four other winds come from the directions of the summer and winter solstitial sunrises and sunsets. This leaves two northern and two southern sectors, by subdividing which directions for four other winds may be found. This arrangement gives twelve sectors of 30 degrees each.

Since each quadrant of the modern compass-card is divided into four sectors instead of into three, there is no convenient way of indicating accurately the directions of the winds according to the chart reconstructed by Professor Thompson. Such directions as I may give are, therefore, only approximate, except for the cardinal points.

In this section of my paper I wish merely to give a fair idea of the weather reputation of each wind. I shall start with the north winds and shall go round the wind-chart clockwise^{23a}. Readers who desire to multiply references may consult the *Thesaurus Linguae Latinae*, which is giving numerous citations under names of winds and doubtless will continue to do so.

Aristotle, the fountain-head of much lore of the winds, makes several general remarks about a group of winds: *Aparctias* (= *Septentrio*²⁴), the north wind; *Thrascias* (= *Circius*), the north-northwest wind, and *Argestes* (= *Caurus*, *Corus*), the west-northwest wind. It seems best to follow Aristotle in grouping the characteristics they have in common²⁵.

Aparctias, *Thrascias*, and *Argestes* are the winds that fall on others most and stop them. Their source is so close to us that they are greater and stronger than other winds. They bring fair weather most of all winds for the same reason, for, blowing as they do, from close at hand, they overpower the other winds and stop them; they also blow away the clouds that are forming and leave a clear sky—unless they happen to be very cold. Then they do not bring fair weather, but being colder than they are strong they condense the clouds before driving them away.

These winds bring hail since they cause sudden condensation²⁶; they give rise to hurricanes also²⁷. Together with *Meses*, the north-northeast wind, they are very commonly accompanied by lightning²⁸. In general all the winds from the north are drier than those from the south²⁹, and likewise more salutary³⁰. The characteristics that Aristotle attributes to these three winds are ascribed to them, of course, in the scattered references made to them by other authors.

Boreas, 'the king of the winds'³¹, is placed, on some wind-charts³², due north, but Pliny³³, who says that *Boreas* is called *Aquilo* in Latin, assigns to it a position between *Aparctias* and the place of the rising sun at the summer solstice³⁴. *Seneca*³⁵ regards *Aquilo* as the most easterly of the winds that emanate from the north. It is, of course, impossible to say that all authors who mention *Boreas* and *Aquilo* located them as precisely as did Pliny and *Seneca*.

Boreas, or *Aquilo*, is cold³⁶, dry³⁷, rainless³⁸, cloud-dispelling³⁹, bright and clear⁴⁰, and also the most salutary of winds⁴¹. It is wintry, too⁴², and can have angry moods⁴³. It is called 'black' by *Strabo*⁴⁴. *Josephus*⁴⁵ mentions a local wind called 'the black north wind' at Joppa; at Antioch some sort of magico-religious rite was conducted against 'black *Boreas*'⁴⁶. With *Meses* and *Aparctias* *Boreas* is snowy⁴⁷; with *Argestes* it makes the heavens thick with clouds⁴⁸. Though it may leave Italy with skies serene, it causes

²¹*Arist.*, *Met.* 2.6, 364 b, 365 a, *ad initium*. See also *Th.*, *De Signis* 36.

²²*Arist.*, *Met.* 365 a; *Th.*, *De Signis* 36. Compare *Varro*, *Marcupor*, as quoted by *Nonius Marcellus* 1.66 (in *W. M. Lindsay's* edition, Leipzig, Teubner, 1903): *ventique frigidus se ab axe erupant phrenetici, septentrionum filii, secum ferentes tegulas, ramos, syrus*.

²³*Arist.*, *Met.* 2.6, 364 b; *Th.*, *De Signis* 37.

^{23a}Pliny 2.126. ³⁰*Th.*, *De Signis* 25.

³¹*Pindar*, *Pythia* 4.181 (322).

³²See, for example, the chart on page 50 of Professor Thompson's article, referred to in the text.

³³2.119-120, 18.333.

³⁴*Timosthenes*, as quoted by *Agathemerus* 3.7 (*C. Müller*, *Geographi Graeci Minores* 2.473), places it between *Aparctias* and *Cacias*.

³⁵5.16.6. ³⁶*Lucan* 5.601; *Isidore* 37.1.

³⁷*Lucan* 4.50; *Ovid*, *Tristia* 3.10.53; *Isidore* 37.1.

³⁸*Isidore*, 37.1 *sine pluvia*.

³⁹*Ovid*, *Metamorphoses* 1.328 *nimbus... Aquilone remotis*. *Isidore*, however, says (37.1): *non discutit nubes sed stringit*. Compare *Lucan* 4.50-51: *Pigro bruma gelu siccis Aquilonibus haerens aethere constricto pluvias in nube tenebat*.

⁴⁰*Vergil*, *Georgics* 1.460 *claro... Aquilone*, and *Servius ad loc.*: *claro Aquilone serenifico*.

⁴¹Pliny 2.127. In *Geoponica* 2.3.4 it is stated that the winds which blow from the rising sun are most salutary.

⁴²*Th.*, *De Ventis* 9.54.

⁴³*Lucan* 5.603 *Scythici... rabies Aquilonis*; *Vergil*, *Aeneid* 3.285 et *glacialis hiems Aquilonibus asperat undas*.

⁴⁴1.7. ⁴⁵*Bellum Iudaeorum* 3.9.3.

⁴⁶*Joannes Malalas*, *Chronographia* 10.343 b. See also *W. M. Lindsay*, *Aquilo, The Black Wind*, *The Classical Review* 42 (1928), 20.

⁴⁷*Th.*, *De Signis* 36; *Orphic Hymn* 80. See also Pliny 2.126 and *Seneca*, *Hercules Oetaeus* 778.

⁴⁸*Th.*, *De Ventis* 9.51, 61; *Bede* 27.

²¹See the first page of the article by Professor Thompson which is referred to in the text, in the next paragraph.

²²*E. W. Webster*, in his translation of Aristotle, *Meteorologica* (Oxford, 1923), is obviously indebted to Professor Thompson. See his chart at 2.6, 363 a. *E. S. Forster*, in his translation of Aristotle, *Problemata* (Oxford, 1927), agrees with Professor Thompson; he had, however, reached similar conclusions independently. See his note at the bottom of the first page of his translation of Book 26.

²³*Arist.*, *Met.* 2.6, 363 b-364 a.

^{23a}This means that I shall go round from left to right. The ancients used "sunwise" in exactly the sense in which I use "clockwise". See *Sunwise* in Webster's New International Dictionary of The English Language, and in the Century Dictionary and Cyclopaedia.

²⁴This equation is given by Pliny 2.119-120.

²⁵*Arist.*, *Met.* 2.6, 364 b (*E. W. Webster's* translation). See also *Arist.*, *Prob.* 26.62; *Th.*, *De Signis* 36, *De Ventis* 1.6-7; Pliny 2.126.

rains in Africa⁴⁹. Pliny⁵⁰ tells us that Aquilo and Auster change their dispositions with a change of place, for in Africa Aquilo is cloudy and Auster is serene. A north wind striking a heated atmosphere naturally causes condensation; if it manages to cross the Mediterranean, it induces precipitation in Africa.

When Aquilo begins to blow violently and stirs up a number of clouds it indicates fair weather⁵¹. In the Orphic Hymns (80) it is invoked to drive away the rain clouds and make the heavens clear. In Proverbs 25.23 it is stated that the north wind driveth away rain^{51a}.

The north wind was keen during the day, but generally fell at night⁵². A Greek proverb says: 'Never did a night-time Boreas reach the third dawn'⁵³. A north wind generally ceased in an odd number of days, a south wind in an even number⁵⁴.

Aquilo attended by lightning indicated storm. So did Eurus attended by thunder⁵⁵. Aquilo itself was heralded by the sudden drying of the earth⁵⁶.

Meses, the north-northeast wind⁵⁷, was commonly accompanied by lightning, as we have seen. Meses and Aparctias were the coldest winds and brought most snow⁵⁸. Meses is infrequently mentioned in weather lore. I suspect that the domain of Boreas or Aquilo extended far enough to the East to absorb its functions⁵⁹. Some of the ancients did in fact regard Boreas and Meses as the same wind⁶⁰.

Caecias⁶¹, the east-northeast wind, sometimes called Hellespontias⁶², was notoriously rainy⁶³. It made the sky thick with clouds⁶⁴, which were heavier than those brought by Lips⁶⁵. Caecias had a reputation for thrusting back to itself the clouds it found before it, so that this characteristic gave rise to a proverb about bringing a thing upon oneself as Caecias brings clouds upon itself⁶⁶.

Apeliotes (= Subsolanus), whose domain Hellespontias shared more than it did that of Caecias⁶⁷, blew from the equinoctial sunrise⁶⁸. It was a wet wind, but brought the rain in light showers⁶⁹. If it started to

blow by day from a clear part of the heavens, it continued throughout the greater part of the night⁷⁰. Attended by thunder from the East it signified temperate weather⁷¹. On the Tower of the Winds at Athens it is represented as the bringer of blessings; its lap is filled with honeycomb, grain, and fruits.

The clouds which the north wind blew from the upper end of the Hellespont were caught by Hellespontias and were driven toward Attica and the islands⁷². The name for this wind was, of course, purely local in origin⁷³.

Eurus, the east-southeast wind, was dry as it started, but became rainy later⁷⁴. It brought clouds⁷⁵; against Lesbos especially clouds were driven by it and by the south winds⁷⁶. Along with Notus and Zephyr it carried heat⁷⁷. It could become fierce; Ovid⁷⁸ uses the expression *truculentior Euris*. In New England the southeast wind is likewise regarded as violent: "If the wind blows from the southeast for twelve hours, it will rain in spite of hell"⁷⁹. Voltumnus, as the Roman called this wind, after the name of an Italian mountain⁸⁰, was drier and warmer than Auster⁸¹, and, with Favonius, was drier than Subsolanus⁸². Lucretius⁸³ calls it *altitlonans*. If it started to blow from a clear part of the heavens, it would not last till night⁸⁴.

This is the wind which helped to bring disaster to the Roman arms at Cannae. Hannibal had noted the habits of this wind and had so arranged his position and the time of starting the battle that this wind almost blinded the Romans at a critical moment⁸⁵.

Between Eurus and Notus was Euronotus⁸⁶ (= Phoenicias)⁸⁷, a warm wind⁸⁸ from the south-southeast. Bede⁸⁹ makes a distinction between this wind and Euroauster, both of which he regards as warm; he puts Euroauster to the right of Notus, Euronotus to the left.

Notus (= Auster), the south wind, seems to be mentioned more frequently than other winds. Without doubt its various weather characteristics are described by a greater variety of synonyms than are those of any other wind. I shall quote a number of descriptions from Latin authors, who, of course, often used the form Notus: udus⁹⁰, umidus⁹¹, umectus⁹², madidus⁹³, imbricus⁹⁴, cum imbribus⁹⁵, imbribus atrum⁹⁶, nigerri-

⁴⁹Lucan 9.422-423. Compare Statius, Thebais 5.11-12, 8.411 cum Libyae Boreas Italos niger attulit imbres.

⁵⁰2.127. ⁵¹Th., De Signis 53.

^{51a}Note Ovid, Metamorphoses 1.262-267, Protinus <Iuppiter> Aeolis Aquilonem claudit in antris...emittitque Notum. Madidis Notus evolat alis..., and 1.328-329 Nubila <Iuppiter> disiecit, nimisque aquilone remotis et caelo terras ostendit et aethera terris. Ovid is here describing how the Flood began and how it was brought to an end. C. K. >.

⁵²Arist., Prob. 26.60.

⁵³Th., De Ventis 8.40. See Arist., Prob., 26.9, 14. In this connection it is pertinent to quote from an author who was familiar with modern weather lore in the Mediterranean, W. H. Smyth, Memoir Descriptive of the Resources, Inhabitants, and Hydrography, of Sicily and Its Islands, 4-5 (London, John Murray, 1874): "The most experienced pilots say, that storms which commerce in the day-time are more violent, and of longer duration than those which spring up during the night".

⁵⁴Th., De Signis 33; Pliny 2.129.

⁵⁵Bede 36; Isidore 38.2. Compare Arist., Met. 2.6, 364 b.

⁵⁶Pliny 18.339.

⁵⁷Pliny 2.120 does not give a Latin equivalent for Meses. He merely states that it is *inter Borean et Caecian*.

⁵⁸Arist., Met. 2.6, 364 b. ⁵⁹Compare note 34.

⁶⁰Ventorum Situs et Appellationes 973 a. This is included in Aristotle's works, though it can hardly be more than a summary.

⁶¹Seneca says (5.16.5) that the Romans had no name for this wind. Pliny (2.120) locates it *inter Aquilonem et exortum aequinoctialem ab ortu solstitiali*.

⁶²Arist., Met. 2.6, 364 b. ⁶³*Ibidem*; Th., De Signis 36.

⁶⁴Th., De Signis 36.

⁶⁵Arist., Met. 2.6, 364 b; Th., De Signis 36.

⁶⁶Arist., *Ibidem*, Prob. 26.1, 29; Th., De Signis 36, De Ventis 7.37; Pliny 2.126; Gellius 2.22.24.

⁶⁷There was some confusion in Sicily between the names Caecias and Apeliotes. See Th., De Ventis 10.62.

⁶⁸Pliny 18.337. ⁶⁹Th., De Signis 35; Pliny 18.337.

⁷⁰Pliny 18.339. ⁷¹Bede 27. ⁷²Arist., Prob. 26.56.

⁷³Herodotus 7.188, 189.

⁷⁴Arist., Met. 2.6, 364 b; Th., De Signis 35. Compare Lucan 1.219 et madidis Euri resolutae flatibus Alpes.

⁷⁵Bede 27; Lucan 2.459; Versus De Duodecim Ventis 14.

⁷⁶Arist., Prob. 26.56.

⁷⁷Arist., Met. 2.6, 364 b; Th., De Signis 36. ⁷⁸Heroides 9.11.

⁷⁹From a newspaper clipping of an article by a meteorologist.

⁸⁰Seneca 5.16.3; Livy 22.46.9. See also Preller-Jordan, Römische Mythologie 1.330, note 2 (Berlin, 1883).

⁸¹Pliny 18.338. Bede, however (27), describes this wind as *cuncta desicans*.

⁸²Pliny 2.126. ⁸³5.745. ⁸⁴Pliny 18.339.

⁸⁵Livy 22.43.10, 22.46.9; Plutarch, Fabius 16.1; Seneca 5.16.4; Frontinus, Strategemata 2.2.7; Valerius Maximus 7.4, Ext. 2; Appian, Romana Historia 7.4.20, 26.

⁸⁶Pliny 2.120.

⁸⁷Arist., Met. 2.6, 364 a says it is opposite Thrascias. See Thompson, as cited in the text, 50. Pliny, however, merely states (2.120) that it is between the winter solstitial sunrise and the south. It did not occur to him to make the equation Euronotus = Phoenicias.

⁸⁸Bede 27. ⁸⁹*Ibidem*. See also Isidore 37.3.

⁹⁰Horace, Epodes 10.19.

⁹¹Vergil, Georgics 1.462; Pliny 2.126; Isidore 37.3.

⁹²Cellius 2.22.14.

⁹³Claudian 24.103; Ovid, Metamorphoses 1.264.

⁹⁴Plautus, Mercator 876. ⁹⁵Columella 11.2.65. ⁹⁶Lucan 5.608.

mus⁹⁷, pluvius⁹⁸, pluvialis⁹⁹, cum pluvia¹⁰⁰, nubifer¹⁰¹, nubilus¹⁰², nimbis gravis¹⁰³, nebulosus¹⁰⁴, rabies Noti¹⁰⁵, procellosus¹⁰⁶, hibernus¹⁰⁷, frigidus¹⁰⁸, fulmine pollens¹⁰⁹, cum grandine¹¹⁰, aestuosus¹¹¹, ventorum calidissimus¹¹², noxius Auster et magis siccus <quam Aquilo>¹¹³.

The weather characteristics of Auster are well summarized by Isidore¹¹⁴. . . . Auster, . . . ex humili flans, humidus, calidus, atque fulmineus, generans largas nubes et pluvias laetissimas, solvens etiam flores. He neglects to add that after south winds there occur especially destructive earthquakes¹¹⁵.

The most vivid picture of Notus is drawn by Ovid¹¹⁶:

Madidis Notus evolat alis,
terribilem picea tectus caligine vultum:
barba gravis nimbis, canis fluit unda capillis,
fronte sedent nebulae, rorant pennaque sinusque,
utque manu lata pendentia nubila pressit,
fit fragor, inclusi funduntur ab aethere nimbi.

Auster was stronger by night than by day¹¹⁷. It blew regularly at the time of the Dog-star¹¹⁸. Unlike Boreas, it was stronger when it was ready to cease than when it began; hence the proverb, 'Sail when the south wind begins and Boreas ceases to blow'¹¹⁹. It stirred up bigger waves, however, than did Aquilo¹²⁰.

Like Eurus, Auster was dry as it began, but wet as it ended¹²¹. For southern Europe in general

When the wind is in the south
It is in the rain's mouth¹²².

Shakespeare uses still another figure:

The southern wind
Doth play the trumpet to his <the sun's> purposes
And by his hollow whistling in the leaves
Foretells a tempest and a blustering day¹²³.

Elsewhere Shakespeare has the simile "Like foggy south puffing with wind and rain"¹²⁴.

Sometimes the north wind coming into conflict with the moisture-laden south wind caused snow¹²⁵. It was evidently this condition that gave rise to the saying, 'If the south wind challenges the north wind, then it snows'¹²⁶.

The portending of heat by the south wind reminds one of Christ's words in Luke 12.55: "When ye see the south wind blow, ye say, There will be heat; and it cometh to pass"¹²⁷.

Auster was heralded when the earth became suddenly moist with dew¹²⁸.

⁹⁷Vergil, *Georgics* 3.278.

⁹⁸Ovid, *Metamorphoses* 1.66; Seneca 5.16.1.

⁹⁹Vergil, *Georgics* 3.429. ¹⁰⁰Columella 11.2.4, 43.

¹⁰¹Valerius Flaccus 2.506.

¹⁰²Propertius 2.16.56; Auctor *Aetnae* 288; Ovid, *Ex Ponto* 2.1.

¹⁰³Statius, *Thebais* 11.520.

¹⁰⁴Seneca, *Agamemnon* 481 (502). ¹⁰⁵Seneca, *Medea* 586.

¹⁰⁶Horace, *Carmina* 1.3.14. ¹⁰⁷Ovid, *Heroides* 2.12.

¹⁰⁸Tibullus 1.1.47. ¹⁰⁹Vergil, *Georgics* 4.261.

¹¹⁰Lucretius 5.745. Compare Servius on Vergil, *Aeneid* 8.429.

¹¹¹Columella 11.2.14, 21, 23, 34.

¹¹²Pliny 2.126. Compare Th., *De Signis* 36; Arist., *Met.* 2.6,

364 b; Bede 36.

¹¹³Seneca 4.2.18. ¹¹⁴Pliny 2.127.

¹¹⁵37.3. See also Bede 27.

¹¹⁶*Metamorphoses* 1.264-269. ¹¹⁷Pliny 2.129.

¹¹⁸Arist., *Prob.* 26.12, 32; Th., *De Ventis* 8.48.

¹¹⁹Arist., *Prob.* 26.45. ¹²⁰Pliny 2.128.

¹²¹Th., *De Signis* 35; *De Ventis* 1.7; Arist., *Prob.* 26.19.

¹²²T. F. Thielton-Dyer, *Folk-Lore of Shakespeare*, 89 (London,

Griffith and Farran, 1884).

¹²³I Henry IV, Act 5, Scene 1, 3-6.

¹²⁴As You Like It, Act 3, Scene 5, 50.

¹²⁵Compare Arist., *Prob.* 26.46; Th., *De Ventis* 7.46, 9.54.

¹²⁶Plutarch, *Moralia* 949 B.

¹²⁷This is quoted by Isidore 38.5. ¹²⁸Pliny 18.339.

Theophrastus brands as false the belief that Notus did not blow near the sea in Egypt or for a day and a night's journey inland from the sea, whereas beyond Memphis it blew freshly for a similar distance¹²⁹.

When the south wind was less strong, it brought clear weather and lasted a shorter time¹³⁰. Leukonotus, the White Notus, which is placed farther to the West, sometimes belied its rain-making character, as Horace states¹³¹:

albus ut obscuro deterget nubila caelo
saepe Notus neque parturit imbris
perpetuo. . . .¹³²

To the west of Notus was Libonotus (= Austro-africus¹³³), the south-southwest wind. Naturally it was a hot wind¹³⁴.

Between Libonotus and Zephyr was Lips (= Liba, or Africus¹³⁵), the west-southwest wind. Its reputation was somewhat like that of Auster, though it is mentioned much less frequently. It was rainy¹³⁶, stormy¹³⁷, cloudy¹³⁸, and brought lightning and thunderbolts¹³⁹. If it blew at the equinox, it brought rain¹⁴⁰. Vergil¹⁴¹ speaks of it as teeming with squalls. It is described as having sable wings¹⁴². Horace¹⁴³ calls it *Africus pestilens*. In this connection one may note the curse of Caliban: "A south-west blow on ye and blister you all o'er"¹⁴⁴.

At Cnidos and Rhodes there was a proverb about Lips and Argestes: 'Lips causes clouds quickly and clear weather quickly; but every cloud follows the wind Argestes'¹⁴⁵.

Zephyr (= Favonius¹⁴⁶) blew from the West. It was warm¹⁴⁷, but agreeably so. It was regarded as the pleasantest of winds¹⁴⁸ and was looked upon as a herald of spring¹⁴⁹ and flowers¹⁵⁰. On its arrival, one might say, spring was officially opened. With it came the birds, a fact which caused it to be called the 'bird' wind, or, less inclusively, the 'swallow' wind¹⁵¹. It was a seasonable wind for sailing¹⁵²; prayers were made to it to send breezes favorable for ships¹⁵³. It rose near or during the evening¹⁵⁴. It was noted for collecting and driving before it the largest clouds¹⁵⁵.

¹²⁹De Ventis 2.8, 10.61. Compare Arist., *Prob.* 26.44.

¹³⁰Arist., *Prob.* 26.20. Compare 26.38. and Th., *De Ventis* 1.

6-7.

¹³¹Horace, *Carmina* 1.7.15-17.

¹³²The Shorey-Laing edition of Horace (on *Carmina* 1.7.15) compares a line of Arnold's Empedocles, "As the sky-brightening south-wind clears the day. . . ."

¹³³Pliny 2.120; Isidore 37.3. Seneca says (5.16.6) that Libonotus has no Latin name. ¹³⁴Isidore 37.3.

¹³⁵Pliny 2.119, 18.336; Seneca 5.16.6.

¹³⁶Arist., *Met.* 2.6, 364 b; Th., *De Signis* 36; Pliny 2.126.

¹³⁷Columella 11.2.4; Bede 27.

¹³⁸Arist., *Met.* 2.6, 364 b; Th., *De Ventis* 36; Dirae 39.

¹³⁹Bede 27. ¹⁴⁰Arist., *Prob.* 26.20. ¹⁴¹Aeneid 1.85-86.

¹⁴²Silius Italicus 12.617 fuscis Africus alis.

¹⁴³*Carmina* 3.23.5.

¹⁴⁴Shakespeare, *Tempest*, Act 1, Scene 2, 323-324.

¹⁴⁵Th., *De Ventis* 9.51. ¹⁴⁶Pliny 18.337.

¹⁴⁷Th., *De Signis* 36; Arist., *Met.* 2.6, 364 b.

¹⁴⁸Arist., *Prob.* 26.31, 55; Orphic Hymn 81.

¹⁴⁹Lucretius 5.737-738; Pliny 18.337; Horace, *Carmina* 1.4.1, 3.7, 2, 4.12.2 (where the expression *animae Thraciae* may refer to Zephyrs); Orphic Hymn 81; Claudii Ptolemaei *Opera Quae Extant Omnia*, *Opera Astronomica* Minora, 2, 38 (Leipzig, Teubner, 1907).

¹⁵⁰Bede 27; Incerti *Versus De Duodecim Ventis* 22.

¹⁵¹Pliny 2.122. See Aristotle, *De Animalibus Historia* 6.2; Columella 11.3.5.

¹⁵²Pliny 2.122.

¹⁵³Orphic Hymn 81. See also the Greek Anthology 12.171; Ovid, *Amores* 2.11.37-42; Claudian 12.41-45 (*Fescennia de Nuptiis Honorii Augusti*).

¹⁵⁴Arist., *Prob.* 26.33, 35.

¹⁵⁵Th., *De Ventis* 7.42; Arist., *Prob.* 26.24; Homer, *Iliad* 11.305.

Shelley's Ode to the West Wind, written in a wood that skirts the Arno, gives one a far different picture of the west wind in Italy:

O wild West Wind, thou breath of Autumn's being,
Thou, from whose unseen presence the leaves dead
Are driven, like ghosts from an enchanter fleeing,
Yellow, and black, and pale, and hectic red,
Pestilence-stricken multitudes! O thou,
Who chariotest to their dark wintry bed

The wingèd seeds, where they lie cold and low,
Each like a corpse within its grave, until
Thine azure sister of the Spring shall blow....

Above Zephyr was Argestes (= Caurus, Corus¹⁵⁶), the west-northwest wind. It was known locally in Athens as Sciron, and in some places elsewhere as Olympias¹⁵⁷. There is much difference of opinion about the Latin equivalent of Argestes. Seneca says¹⁵⁸ that Corus was called Argestes by some, but that Corus is violent, whereas Argestes is usually gentle. Corus could make the sea squally and fierce¹⁵⁹. Like other northern winds it was cold¹⁶⁰. It was dry except when it was ceasing¹⁶¹. It gathered clouds and drove them away¹⁶². Lucan¹⁶³ calls it *caeli fuscator Eoi*. In the Orient it brought clouds, but in India it brought clear weather¹⁶⁴.

It was attended by hail¹⁶⁵. On a clear night lightning accompanied by Corus, Auster, or Favonius meant wind and rain from the direction of these winds¹⁶⁶. From the murmur of the waters Caesar's boatman on the adventurous trip from Greece to Brundisium predicted the blowing of Corus¹⁶⁷.

Thrascias (= Circius) has already been mentioned in connection with the north winds in general. It was given to hail and snow¹⁶⁸. The name Circius is infrequent; it was evidently a local name¹⁶⁹. In Provincia Narbonensis, Liguria, and part of Etruria Thrascias (= Circius) tempered the climate, though it might at times be violent enough to unroof houses¹⁷⁰. In spite of its power the people were grateful to it, believing that it caused their healthful climate¹⁷¹.

(To be Continued)

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REVIEW

Petronius, The Satiricon. Edited, With Introduction and Notes, by Evan T. Sage. New York: The Century Co. (1929). Pp. xl + 228.

Professor Sage's edition of Petronius is the best available text-book for teaching Petronius. Professor

Sage gives us his own text¹ of the Satiricon complete, and provides a commentary for those passages which, he thinks, can be read with a class. The Introduction offers sections on The Satiricon and its Background (xi-xiv), The Originality of Petronius (xiv-xvii), The Satiricon (xvii-xviii), The Style of the Satiricon (xviii-xxi), Petronius (xxi-xxiii), The History of the Text (xxiii-xxv), First Appendix—MSS and Editions (xxv-xxviii), Second Appendix—Informal Latin (xxviii-xxxiv), and Synopsis of the Satiricon (xxxv-xxxvii). On pages 197-214 there are fourteen Supplementary Notes intended for the more advanced student. There are, finally, a useful Bibliography (215-219), an Index Nominum (221-222), and an Index Rerum (223-228). The references in the latter Index are needlessly cryptic.

In one respect this good text-book is a disappointment. The editor states (Preface, vii) that his book is meant for undergraduates, i.e. for College students; there is, accordingly, an apparent effort to simplify the Introduction and the Notes, and to avoid discussion of moot questions. But in all our Colleges Petronius is likely to be an elective course, and older students might well profit from a more adult treatment. A full edition of Petronius, with proper Introduction and critical and exegetical commentary, is still wanted, and it is to be regretted that Professor Sage, who is eminently competent to provide such an edition, has not done so.

COLUMBIA UNIVERSITY

MOSES HADAS

THE NEW YORK CLASSICAL CLUB

The annual election of officers of The New York Classical Club for 1930-1931, held Saturday, May 3, resulted as follows: President, Miss Beatrice Stepanek, Eastern District High School, Vice President, Professor Allan P. Ball, College of the City of New York, Secretary-Treasurer, Professor E. Adelaide Hahn, Hunter College, Censor, Leo A. Hanigan, Alexander Hamilton High School.

The address of the meeting was delivered by Dr. Walton B. McDaniel, of the University of Pennsylvania. His very interesting lecture, illustrated, on Linking the Old With the New in Italy, was greatly enjoyed.

At the luncheon at the Men's Faculty Club the principal speakers were Dr. John L. Tidsley, District Superintendent of Schools, New York City, Professor Antoine Meillet, University of Paris, and Dr. McDaniel.

LEO A. HANIGAN, Censor

¹⁵⁶Pliny 18.338. Compare, however, 2.119.

¹⁵⁷Arist., Met. 2.6, 363 b; Pliny 2.120. ¹⁵⁸5.16.5.

¹⁵⁹Seneca, Medea 414-417. ¹⁶⁰Pliny 2.126, 18.338; Grattius 420.

¹⁶¹Pliny 2.126. ¹⁶²Ibidem. ¹⁶³Lucan 4.66-67. ¹⁶⁴Bede 27.

¹⁶⁵Pliny 2.126, 18.339.

¹⁶⁶Pliny 18.354. ¹⁶⁷Lucan 5.571-572. ¹⁶⁸Bede 27.

¹⁶⁹See, for example, Lucan 1.497; Seneca 5.17.4.

¹⁷⁰Pliny 17.21. See also 2.121. ¹⁷¹Seneca 5.17.4.

¹For a criticism of the text, as well as of certain statements in the Introduction and the Notes, see the review of the book by Professor Ben E. Perry, in The American Journal of Philology 50 (1929), 300-304.



Greek and Roman Weather Lore of Winds (Continued)

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Reviewed work(s):

Source: *The Classical Weekly*, Vol. 24, No. 3 (Oct. 20, 1930), pp. 18-24

Published by: [Classical Association of the Atlantic States](#)

Stable URL: <http://www.jstor.org/stable/4389497>

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article on The Loeb Classical Library in August last, at Lexington, Kentucky, far away from my books and far away from any extensive classical library. I was none the less sure that on page xviii, under IX, Professor Foster had made a slip when he wrote the following: "Frank Frost Abbott, A History and Description of Roman Political Institutions. Boston, 1901". On my return home I found that there were two later editions, in 1907 and in 1911. The book is published by Messrs. Ginn and Company.

In THE CLASSICAL WEEKLY 18.162 I gave a specimen of Professor Foster's powers as a translator. I give here his version of 21.37⁴ (pages 107, 109, 111).

At last, when men and beasts had been worn out to no avail, they encamped upon the ridge, after having, with the utmost difficulty, cleared enough ground even for this purpose, so much snow were they obliged to dig out and remove. The soldiers were then set to work to construct a road across the cliff—their only possible way. Since they had to cut through the rock, they felled some huge trees that grew near at hand, and lopping off their branches, made an enormous pile of logs. This they set on fire, as soon as the wind blew fresh enough to make it burn, and pouring vinegar over the glowing rocks, caused them to crumble. After thus heating the crag with fire, they opened a way in it with iron tools, and relieved the steepness of the slope with zigzags of an easy gradient, so that not only the baggage animals but even the elephants could be led down. Four days were consumed at the cliff, and the animals nearly perished of starvation; for the mountain tops are all practically bare, and such grass as does grow is buried under snow. Lower down one comes to valleys and sunny slopes and rivulets, and near them woods, and places that begin to be fitter for man's habitation. There the beasts were turned out to graze, and the men, exhausted with toiling at the road, were allowed to rest. Thence they descended in three days' time into the plain, through a region now that was less forbidding, as was the character of its inhabitants.

(13) Ovid, The Art of Love, and Other Poems. By J. H. Mozley (1929). Pp. xiv + 382.

In 1928 Mr. J. H. Mozley contributed to The Loeb Classical Library a version of Statius, *Silvae*, *Thebais*, and *Achilleis*, in two volumes. Of that work something was said in THE CLASSICAL WEEKLY 22.164-165.

Mr. Mozley's volume on Ovid contains Introduction (vii-xiv); Text and Translation of the following pieces: On Painting the Face⁵ (*De Medicamine Faciei Liber*: 2-9), The Art of Love, (*Ars Amatoria*), Books I-III (12-175), The Remedies of Love⁶ (*Remedia Amoris*: 178-233), The Walnut-Tree (*Nux*: 236-249), *Ibis* (252-307), On Sea-Fishing (*Halieuticon*: 310-321), and A Poem of Consolation (*Consolatio ad Liviam*: 324-357); Appendix: On Cursing in Ancient Times (359-372); Index of Names (373-379); Index of Subjects (381-382).

In the Introduction Mr. Mozley deals with the following topics: I. The Didactic Love-Poems <of

Ovid> (vii-x), II. Miscellaneous Pieces (x-xii), The Manuscripts (xii-xiv). There is also a Note on Editions, etc. (xiv). I reproduce here, in full, the Note on Editions, etc.

The "Ars" was edited with commentary by P. Brandt, Leipzig, 1902, and the "Ibis" by Robinson Ellis, Oxford, 1881. For the numerous articles, dissertations, etc., the student is referred to Schanz, *Römische Literaturgeschichte*, vol. II, Pt. i.

Here again we have an English contributor to The Loeb Classical Library forgetting entirely the purpose of the Library. The Library was not intended primarily for 'scholars': does a scholar need a translation of Cornelius Nepos, of the *Apology* and the *Crito* of Plato, of Vergil's *Aeneid*, of Homer? The Loeb Classical Library was meant for the man who had had little or no Latin and Greek, or for the man who, though trained once as men other than 'scholars' were, in an earlier generation, in Latin or in Greek, or in both, had, in the pressure of life's occupations, lost much of the knowledge of the classical languages he once possessed. Will such a man have at his command Schanz's great (and huge) work? Would it not have been not only more scholarly but also more kindly to warn the 'general reader' that various parts of Schanz's work have appeared in different editions, and to tell him to which edition he should go, and also to tell him where and when that edition was published?

It is a pleasure—a very great pleasure—to an American to be able to say, without hesitation, that the Introductions to the volumes contributed by American scholars to The Loeb Classical Library are, many of them, far superior to the Introductions to volumes contributed by a good many of the English scholars who have had a part in the making of the Library (for one wholly admirable exception see my remarks in THE CLASSICAL WEEKLY 22.153-154 on A. W. Mair's translation of Oppian, *Colluthus*, *Tryphiodorus*. For a grievously defective volume see my remarks in THE CLASSICAL WEEKLY 22.154 on W. R. M. Lamb's volume on Plato. See also my remarks in THE CLASSICAL WEEKLY 24.2).

CHARLES KNAPP

GREEK AND ROMAN WEATHER LORE OF WINDS

(Continued from page 16)

ETESIAN WINDS

The etesian or seasonal winds are frequently mentioned in classical literature, though there is no exact agreement in regard to their periods or their duration¹⁷². There seems to have been a tendency to associate them with prevailing winds¹⁷³, but in general they were regarded as blowing from the north in summer and from the south in winter¹⁷⁴. Aristotle¹⁷⁵ says that they blew after the summer solstice and the

⁴This is the famous passage which tells of the splitting of Alpine rocks by fire and vinegar. For discussions of the passage see THE CLASSICAL WEEKLY 15.168, 16.73-76, 96, 128, 18.88, 22.98-99. Professor Foster has an excellent note on the passage (see pages 108-109).

⁵On Painting the Face is not in any sense a translation of *De Medicamine Faciei*. Better would be On Doctoring the Face; this would be at least an up-to-the minute version. So The Remedies of Love does not render *Remedia Amoris*. *Amoris* is an objective genitive; of *Love* is ambiguous.

¹⁷²See Gilbert (as cited in the text, near the beginning of this paper), 571, note 1; Arist., *Met.* 2.6. 362 a.

¹⁷³See, for example, Arist., *Met.* 2.6. 365 a; Th., *De Ventis* 2.10-12; Gellius 2.22.30; Pliny 2.124, 18.335; Lucretius 5.742; Diodorus 1.39.6.

¹⁷⁴See, for example, Tacitus, *Annales* 6.33.

¹⁷⁵*Met.*, 2.6, 362 a.

rising of the Dog-star. Seneca¹⁷⁶ tells us that they started at the time of the summer solstice and that they relieved the severity of the scorching summer months. They did not blow strongly in Italy after the rising of the Dog-star¹⁷⁷, a condition that seems at one time to have been paralleled on the island of Ceos. After the people of the island had suffered for a long time from drought and pestilence Aristaeus interceded with Zeus, who caused the etesian winds to blow for forty days after the rising of Sirius¹⁷⁸. These winds were salubrious and refreshing¹⁷⁹.

Cicero¹⁸⁰ says that the etesian winds made voyaging by sea speedy and certain¹⁸¹. They did—if one was going in their direction. In 218 B. C. Messenians implored Philip V of Macedon to come to their aid, pointing out that with the help of the winds he could easily sail from Cephallenia in one day. A secret enemy of Philip supported the proposal, knowing that, if Philip acceded, the summer would be wasted by him, since he could not sail back during the period of the winds¹⁸².

On one occasion a pilot urged Dion to seek safety upon the shore of Sicily from a menacing storm, reminding him that, if they should be blown away from the land, they would be tossed about for many days awaiting a south wind during the summer season¹⁸³.

Another example of a certain tendency of the winds to blow in one direction is to be found in the caption of a picture in the National Geographic Magazine¹⁸⁴.

Cretan windmills operate only when the wind blows from one point of the compass. But the strong breezes of the island do blow chiefly in one direction most of the time, and hence this row of windmills combs the gusts as they sweep down the valley.

The power of the etesian winds was mentioned very frequently in connection with the Nile¹⁸⁵. The ancients never tired of telling how they drove back the waters of that river.

These winds ceased at night and rose about the third hour of the day¹⁸⁶. Because of their reluctance to get up in the morning the sailors called them 'sleepy-headed' and 'dainty'¹⁸⁷. By contrast this reminds one of an old saying: "A northwest wind is a gentleman and goes to bed".

Seneca records that the whole of India and Ethiopia was watered by constant rain during the prevalence of etesian winds¹⁸⁸. In some places this period was a favorite period for drying and harvesting salt from evaporating sea water¹⁸⁹.

LOCAL WINDS

There were, of course, many local winds, *peculiares quibusque gentibus venti*¹⁹⁰, for instance the Iapygian in Calabria, the Scironian in Athens, the Cataegis in Pamphilia¹⁹¹. Horace prays that Iapyx may take Vergil safely to Greece¹⁹², for even an *albus Iapyx* may be stormy¹⁹³. This is the wind that aided Cleopatra in her flight from the battle of Actium¹⁹⁴. St. Paul¹⁹⁵ speaks of "a tempestuous wind called Euroclydon".

Our own Continent has winds with local names. The name 'chinook' is derived from the name of an Indian tribe that once lived near the mouth of the Columbia River. Members of a trading-post established by the Hudson Bay Fur Company at Astoria, Oregon, noticing that a warm southwest wind blew from over the Indian camp, called it 'chinook', a term that has been much extended¹⁹⁶. In the level coastal plain of South Carolina the sea winds which wander inland and cool the hot villages are known as 'pine-land breezes' because they whisper through the tops of the long-leaf pines¹⁹⁷.

THE SUN AND THE PERIODS OF CERTAIN WINDS

We have seen that the directions of the principal winds were referred to various positions of the sun. The periods of certain winds were likewise associated with this body¹⁹⁸.

Thus Caecias and in general the winds north of the summer solstice blow about the time of the spring equinox, but after the autumn equinox Lips; and Zephyrus about the summer solstice, but about the winter solstice Eurus.

The etesian winds started to blow after the summer solstice¹⁹⁹. The periods of other winds too might be dated with reference to the solstices and the equinoxes²⁰⁰.

Recently a Michigan seeress gave me the following directions: "Watch which way the wind is when the sun crosses the line. That will be the prevailing direction for the season". Another friend informs me that, if the wind is prevailing in the West or in the Southwest on March 21, one may look for an early spring, but, if the wind is in the Northwest at that time, one should look for a backward spring, because the wind will be in that direction for most of the time for three months.

In a previous paper I listed a number of other weather associations of the wind and the sun²⁰¹.

THE WEATHER-VANE

The close association between wind and weather in general is shown by our giving to the device which shows the direction of the wind the name weather-vane rather than wind-vane. The contrivance shows

¹⁷⁶5.10.1-2. ¹⁷⁷Seneca 5.10.2.
¹⁷⁸Diodorus 4.82.1-3; Apollonius Rhodius 2.516-527; Clemens Alexandrinus, Stromata 6.28.4-6; Callimachus, Aitia 3.1 (page 209 of A. W. Mair's translation, in The Loeb Classical Library); Nonnus 5.269-279. See also Geoponica 1.9.7.

¹⁷⁹Cicero, De Natura Deorum 2.131. Compare Geoponica 1.12.15, 31, 36.

¹⁸⁰Cicero, De Natura Deorum 2.131.

¹⁸¹Compare Seneca, Thyestes 126-129 nives quas... aestas veliferis solvit Etesias. See also Aratus, Phaenomena 151-156.

¹⁸²Polybius 5.5.3-7. ¹⁸³Plutarch, Dion 25.1-2. See also 23.3.155.207 (February, 1929). I confess that the caption taxes my credulity.

¹⁸⁴Herodotus 2.20; Athenaeus 2.87; Pomponius Mela 1.53; Diodorus 1.38.2; Seneca 4.2.21-23; Pliny 5.55; Lucretius 6.712-718; Ammianus Marcellinus 22.15.5, 7. Not less interesting is Tacitus, Annales 6.33.

¹⁸⁵Pliny 2.127. See also Arist., Met. 2.6, 362 a.

¹⁸⁶Seneca 5.11.

¹⁸⁷5.18.2. According to Arrian 6.25 the country of Gedrosia was likewise supplied with rain by periodical winds.

¹⁸⁸Strabo 13.1.48, at the end.

¹⁹⁰Pliny 2.120. See also Seneca 5.17.4; Th., De Ventis 10.62; Procopius 8.4.10; Isidore 37.5. The most important source for references to local winds is Ventorum Situs et Appellationes, which is based upon a work of Aristotle.

¹⁹¹Seneca 5.17.4; Vitruvius 1.6.10. ¹⁹²Carmina 1.3.4.

¹⁹³Horace, Carmina 3.27.20. ¹⁹⁴Gellius 2.22.23.

¹⁹⁵Acts 27.14.

¹⁹⁶A. T. Burrows, The Chinook Winds, The Journal of Geography 2 (1903), 124-136.

¹⁹⁷The Atlantic Monthly 144 (1929), 349.

¹⁹⁸Arist., Met. 2.6, 364 b. (E. W. Webster's translation).

¹⁹⁹Ibidem, 362 a. ²⁰⁰See THE CLASSICAL WEEKLY 22.26.

²⁰¹THE CLASSICAL WEEKLY 22.29. Zeno, as quoted by Diogenes Laertius, Book 7, Chapter 1, Section 81. 152, says that the sun produces winds by turning the clouds into vapor.

more than the direction of the wind. It indicates also the kind of weather to follow, since in popular weather lore the wind is the pulse of the weather.

So far as I am aware, the earliest weather-vane of which we have any record played 'I spy' with the wind upon the beautiful octagonal Tower of the Winds which was erected in Athens, in the first century before Christ, by Andronicus of Cyrrhus. It consisted of a triton holding a rod in his right hand and working on a pivot in such a way that the rod always pointed at the figure which typified the prevailing wind²⁰². With the help of the eight bas-reliefs below even a casual visitor in Athens might be able to identify the wind.

In far later times the cock adorned weather-vanes on Church spires. The reason for its selection, according to a medieval Latin poem, is that it was *mirabilis Dei creatura*, with many wholesome lessons to teach to the followers of Christ²⁰³.

Makeshift ways of telling from which direction the wind is coming are much more interesting than the use of the weather-vane. A peculiar method practised by seafaring men is thus described by Miss Pearl Wilson in THE CLASSICAL WEEKLY 10.24:

...If you hold your head so that the wind comes straight into one ear, and then turn it slowly till it is blowing with equal force in both ears, you will find yourself then facing it directly.

Attention has been called²⁰⁴ to this method in connection with Vergil, Aeneid 3.513-514:

haud segnis strato surgit Palinurus et omnis
explorat ventos atque auribus aera captat.

In THE CLASSICAL WEEKLY 13.219 I quoted a striking confirmatory passage from Kipling, Captains Courageous²⁰⁵:

He <Dan, the captain's son> could steer in anything short of half a gale from the feel of the wind on his face, humoring the We're Here just when she needed it²⁰⁶.

In Joseph Conrad's short story, The Inn of the Two Witches^{206a}, the following statement is made of a seaman who had an adventure on land during a storm: "...he steered his course by the feel of the wind".

A method not entirely unlike that of sailors of old is attributed to one of the characters in The Story of Kennett, by Bayard Taylor²⁰⁷:

Once, indeed, she stopped, wet her forefinger with her tongue, and held it pointed in the air. There was very little breeze, but this natural weathercock revealed from what direction it came.

"Southwest!" she said, nodding her head—"lucky!"

An odd practice is that of tasting the wind to prophesy the direction of a coming wind. It is resorted to by a negro in Du Bose Heywood, Porgy²⁰⁸:

²⁰²Vitruvius 1.6.4.

²⁰³Stephen Gaselee, The Oxford Book of Medieval Latin Verse, 178-180 (Oxford: At the Clarendon Press, 1928).

²⁰⁴Hermes 42.44-45.

²⁰⁵Page 154 of the edition published by The Century Company for The Review of Reviews Company. <Pertinent is a note on Aeneid 3.514, by Dr. B. W. Mitchell, THE CLASSICAL WEEKLY 7 (1914), 168. C. K.>.

²⁰⁶Compare a humorous sentence of O. Henry, in The Passing of Black Eagle, one of the stories in Roads of Destiny: "They want them whiskers and that nose of his to split the wind at the head of the column".

^{206a}The story is to be found in a volume entitled Within the Tides: Tales, 210 (New York, Doubleday, Page, and Co., 1916).

²⁰⁷Page 2 (New York, Putnam, 1867).

²⁰⁸Page 137 (New York, George H. Doran Co., 1925).

Standing in the bow, he moistened his finger, and held it up to the wind. "You mens bes' git all de fish yuh kin tuhday", he admonished. "Win' be in de eas' by tuhmorruh. It gots dot wet tas' ter um now."

THE FARMER AND THE WINDS

Perhaps no classes of persons were more keenly interested in the winds and their directions than farmers and sailors²⁰⁹. The farmer gave heed to the wind in relation not only to the immediate activities of the day, but also to the general management of the farm throughout the year. For the benefit of the farmer Columella tells the kinds of weather to be expected at the rising and the setting of many stars throughout the year. It is but seldom that he fails to mention wind²¹⁰.

The north wind was so severe that the pruner had to guard against exposing to it the incisions he made, and orchards and vineyards in general were not to face it, except in Africa (i. e. the province), Cyrene, and Egypt²¹¹. Trees were not to be dug up for transplanting with the wind blowing from the north or from any direction between it and the point of rising of the sun at the winter solstice; at any rate the roots were not to be exposed to these winds, since they killed the trees, and farmers did not always know why. Cato thought that rains and all winds should be avoided in transplanting²¹².

Trees and vines were to be planted so that they would be exposed to Aquilo²¹³. Democritus thought that this produced more fragrant fruit²¹⁴. There was a belief that this exposure caused trees to thrive and sprout and that the cold in season made them more compact and harder²¹⁵. In vineyards, however, stakes were so arranged as to break the force of Aquilo and to shield the vines from cold²¹⁶.

When Aquilo prevailed, no plowing, planting, or sowing was to be done. The cold would injure sprouting seed and would even freeze the roots of trees that were being transplanted. Praedoctus esto: alia robustis prosunt, alia infantibus²¹⁷. Cato advised that in the operation of transplanting trees the bark should be marked so that the tree could be reset in the same direction; otherwise the northern part would be scorched by southern suns and the southern part frozen by Aquilo²¹⁸.

Whoever felt the cold of Aquilo was to beware. It was more dangerous than the north wind. In Asia, Greece, Spain, coastal Italy, Campania, and Apulia, however, orchards and vineyards were to face it²¹⁹. In Italy beehives were to face neither Aquilo nor Favonius, but the East²²⁰.

There was a widespread belief that male cattle were conceived when the parents were facing Aquilo²²¹.

²⁰⁹See amusing passages in Lucian, Icaromenippus 25-26.

²¹⁰He mentions wind in 11. 2, 4, 14, 15, 20, 21, 22, 24, 31, 34, 36, 37, 39, 40, 43, 45, 49, 51, 52, 58, 63, 65, 66, 74, 77, 78, 84, 88, 89, 93, 94, 97. ²¹¹Pliny 18.328. ²¹²Pliny 17.85-86. ²¹³Pliny 18.334.

²¹⁴Pliny 17.23.

²¹⁵Pliny 17.10. See also Th., Historia Plantarum 4.1.4, 5.1.11.

²¹⁶Columella 4.16.3. See also Pliny 17.10.

²¹⁷Pliny 18.334. ²¹⁸Pliny 17.83. ²¹⁹Pliny 18.335-336.

²²⁰Pliny 21.80. See also Geoponica 15.2.1.

²²¹Pliny 8.189, 18.336; Geoponica 17.3.6; Columella 7.3.12; Palladius, July, 4.4; Aristotle, De Animalibus Historia 6.19. De Generatione Animalium 4.2.

In healthful regions villas and vineyards were to face Subsolanus²²². The Geoponica²²³ advises having the house face the rising sun, because Notus was damp and capricious and unwholesome. Pliny²²⁴ records the same advice for villas in temperate regions, but says that in hot places they should face the north, in cold places the south.

It was recommended that apiaries and vineyards of Italy and Gaul should face Voltumnus²²⁵.

Those who were planting olives were to be on their guard against Notus for four days at the rising of the Vergiliae. While it was blowing the farmer was not to fell timber or to handle wine, since for Italy this wind meant either moisture or much heat. Palms might face this wind, but not the pruned parts of trees or vines. The man who did grafting was fearful of its effect on twigs and buds²²⁶. Grafting of olive trees and fig trees was not to be done with a south wind blowing²²⁷. Pruning of vines and trees should be done with dry winds blowing²²⁸.

Budding trees and those in bloom were injured by a hot wind and by a cold wind²²⁹. Under the spell of Auster fruit matured more quickly, but not so well²³⁰. Both vines and trees thrived better when they were facing Aquilo²³¹.

Dolia were not to be opened except on a clear day, with Auster blowing and the moon full²³². Some wine-tasters tasted wine with the north wind blowing because then the wine was clear and undisturbed, but experts thought that better proof of the quality of wine was to be had under the trying conditions provided by Auster²³³. A writer who visited Sicily half a century ago says that "wine cannot be fined" during the days when the sirocco is blowing²³⁴.

As the north wind caused the conception of male cattle, so the south wind insured the birth of females²³⁵. Africus, too, influenced the conception of females²³⁶.

It was recommended that granaries should face either Septentrio or Aquilo, since it was believed that winds from other directions generated insects destructive to grain²³⁷. It was supposed that book worms owed their origin to south winds. For this reason Vitruvius²³⁸ was opposed to having the library of a house face this direction.

Pliny informs us that animals mated and began to conceive when Favonius started to blow. This wind he calls *genitalis spiritus mundi*. An even more vivid expression of the same idea is the peasants' name for it, *catlithio*²³⁹. In this connection it is pertinent to quote from a description of an old Scotch custom²⁴⁰:

²²²Pliny 18.337. ²²³2.3.6. ²²⁴18.33. ²²⁵Pliny 18.338.

²²⁶Pliny 18.329. On handling wine see also Cato 31.2.

²²⁷Pliny 17.112; Cato 40.1. ²²⁸Pliny 15.62.

²²⁹Th., De Causis Plantarum 4.14.1. ²³⁰Pliny 17.11.

²³¹Pliny 17.23. ²³²Pliny 14.135. ²³³Geoponica 7.7.1.

²³⁴Smyth (as cited in note 53), page 5.

²³⁵Pliny 8.189, 18.330; Columella 7.3.12; Geoponica 17.3.6;

Aristotle, as cited in note 221.

²³⁶Pliny 18.336.

²³⁷Vitruvius 6.6.4. <See also THE CLASSICAL WEEKLY 23.49,

column 2. C. K.>

²³⁸6.4.1. Aelian says (De Natura Animalium 17.40) that a heavy

atmosphere brings *τετραγυαβα* into being.

²³⁹Pliny 16.93-94. In the Transactions and Proceedings of the

American Philological Association 51.110 I devoted over half a

page to the belief in the fecundating powers of the winds.

²⁴⁰W. Carew Hazlitt, Faiths and Folklore. A Dictionary of

National Beliefs, Superstitions and Popular Customs, Past and

Present, with Their Classical and Foreign Analogues, Described

and Illustrated, 638 (London, Reeves and Turner, 1905).

The first night of the new year, when the wind blows from the west, they call *dàr-na coille*, the night of the fecundation of the trees; and from this circumstance has been derived the name of that night in the Gaelic language.

Cato advised that olive trees should face Favonius²⁴¹. Since Favonius softened the ground, it indicated the time to prune vines, tend to fruits, plant trees, and give attention to olive trees. By its breezes this wind nursed things along²⁴². Unless the berries of olive trees were plucked before Favonius came, they acquired new strength and clung to the trees²⁴³.

In Provincia Narbonensis and in Liguria and part of Etruria it was considered folly to sow in the face of Circius, but far-sighted to receive it from one side²⁴⁴.

LOCAL WINDS AND WARFARE

A knowledge of the peculiarities of local winds was a great military asset and sometimes meant the difference between victory and defeat²⁴⁵. I shall give two examples of this by land and two by sea.

A good illustration of the deliberate, rather than the fortuitous, use of the wind is to be found in the career of Camillus. Latins and Volscians, caught between two Roman forces, barricaded their encampment with a formidable wooden palisade. The Romans had to act before a relieving force should come. Noticing that a strong wind blew down from the mountains regularly at sunrise²⁴⁶, Camillus planned a daybreak attack with two contingents, one armed with weapons, the other with fire. The fire was directed at the point where the wind struck the defences with greatest speed. The fiery darts found lodgment in the crowded timbers of the palisade and flames soon spread in every direction and finally reached the camp. Few of the Latins made their escape²⁴⁷.

Beyond the river Tagonius in Spain amid the caves and hollows of a cliff that faced the north dwelt the Characitani, a tribe that felt boastfully secure in the fastnesses of its retreat. Sertorius, encamping at the base of the cliff, found it unassailable, but he noticed that great quantities of dust were being carried against the openings from the porous and crumbly soil below. Learning the local characteristics of the wind, he had his men collect loose earth, which the barbarians regarded as a mound for a futile assault upon them. The next day, however, a breeze sprang up which grew stronger and stronger and carried up more and more dust. Horses were driven back and forth through it in order to pulverize it still more. Since all the caves faced the wind, the barbarians were soon being blinded and choked. They held out with difficulty for two days, but surrendered on the third. The peculiar nature of this feat added greatly to the prestige of Sertorius²⁴⁸.

²⁴¹Pliny 15.21, 18.337; Cato 6.2; Varro, De Re Rustica 1.24.1.

²⁴²Pliny 18.337. ²⁴³Pliny 15.12. ²⁴⁴Pliny 17.21.

²⁴⁵I am planning to discuss in a general volume on ancient warfare

the effect of the weather on military operations both by land and by

sea. I touched upon the subject in THE CLASSICAL WEEKLY 23.4.

²⁴⁶On the association of the wind with sunrise see Arist., Met. 2.5,

361 b, Prob. 26.34; Th., De Ventis 3.16-18; Pliny 2.129. For

mention of this association in connection with military operations

see Livy 25.27.6, 29.27.8; Lucan 5.717-718. <See also note 85,

above. C. K.>

²⁴⁷Plutarch, Camillus 34.4-5. ²⁴⁸Plutarch, Sertorius 17.3-7.

A good example of the effect of the local vagaries of wind upon naval warfare is afforded by the Battle of Salamis²⁴⁹:

Themistocles is thought to have divined the best time for fighting with no less success than the best place, inasmuch as he took care not to send his triremes bow on against the Barbarian vessels until the hour of the day had come which always brought the breeze fresh from the sea and a swell rolling through the strait. This breeze brought no harm to the Hellenic ships, since they lay low in the water and were rather small; but for the Barbarian ships, with their towering sterns and lofty decks and sluggish movements in getting under way, it was fatal, since it smote them and slewed them round broadside to the Greeks, who set upon them sharply. . .

During the Peloponnesian War twenty Athenian vessels under Phormio attacked forty-seven vessels of the Corinthians and their allies in the Corinthian Gulf. Even this numerical superiority did not give the enemy confidence, for they formed in a circle with the prows outward. The Athenians sailed round and round them, keeping them ever alert for an attack. But Phormio had given orders not to charge; he was hoping that the enemy would not be able to keep their ships in order and also that a breeze which usually blew from the gulf toward dawn would spring up and complete the confusion. When the wind observed its daily schedule, the Athenians made the long-delayed attack. They sank some ships and captured twelve others as they were fleeing²⁵⁰.

HARBINGERS OF WIND

There were many ways of judging what kind of wind was going to blow. Pindar has a sentence with a proverbial ring, to the effect that the wise man knew what the third day's wind was going to be²⁵¹. The air as it condensed gave indications by its thickness or thinness or by its cold or heat and by other characteristics also²⁵², but the winds themselves were good indexes.

When winds, instead of being dispersed by other winds, died down of their own accord, they changed to the next wind to the right, going around the compass-chart sunwise²⁵³. If the wind that happened to be blowing was felt to be hot, one might conclude that it would last for several days²⁵⁴.

Seneca²⁵⁵ mentions breezes which rose before day-break, but fell when the sun became strong. They started in the spring and ceased by the end of summer.

If periodic winds have been blowing for a long time, and a windy autumn follows, the winter is windless: if however the contrary happens, the character of winter is also reversed²⁵⁶.

The earth, too, was a prophet, for, as Pliny²⁵⁷ tells us, it proclaimed a north wind when it was becoming dry, but a south wind when it was becoming moist with

dew. Theophrastus²⁵⁸, however, simply says that during a northerly wind everything dries up, but during a south wind there is abundant moisture.

It is said that breezes do not blow from a river in a hot country. The Nile, the source and mouth of which are in hot lands, is given as an example of this²⁵⁹. It seems that rivers had a reputation for not stirring up breezes in the morning, for we are told that Hannibal planned the Battle of Cannae in a way to take advantage of local conditions when he learned that the Volturnus caused strong winds to blow in the morning²⁶⁰.

When rain comes, wind ceases, but wind generally follows rain in those places where the rain falls²⁶¹. A south wind generally blows after snow and a north wind after hoar-frost²⁶².

Aristotle was much interested in the connection between shooting stars and wind²⁶³. Signs from them and from comets are given in THE CLASSICAL WEEKLY 20.46²⁶⁴, 23.12.

If the sky is overcast, wind comes from the quarter in which the sun is first seen²⁶⁵, or, as Pliny²⁶⁶ puts it, in which the scattering of the clouds has revealed the sky. Other relations of clouds and winds are noted in THE CLASSICAL WEEKLY 23.3.

Thunder and lightning, too, were studied as indexes of the winds that were to be expected. The signs derived from them are thus summarized by Theophrastus:

If lightning comes from all sides, it indicates rain, and from any quarter from which the flashes come in quick succession there will be wind. In summer from whatever quarter lightning and thunder come, there will be violent winds²⁶⁷; if the flashes are brilliant and startling, the wind will come sooner and be more violent; if they are of gentler character and come at longer intervals, the wind will get up gradually. In winter and autumn however the reverse happens, for the lightning causes the wind to cease; and, the more violent the lightning and thunder are, the more will the wind be reduced. In spring I consider that the indications would not so invariably have the same meaning,—and this is also true of winter.

If, while a south wind is blowing, there comes lightning from the north, the wind ceases. If there is lightning at dawn, the wind generally ceases on the third day: other winds than a south wind however do not cease till the fifth seventh or ninth day, though a wind which got up in the afternoon will cease sooner²⁶⁸.

Thunder in winter at dawn indicates wind²⁶⁹ rather than rain; thunder in summer at midday or in the evening is a sign of rain. If lightning is seen from all sides, it will be a sign of rain or wind²⁷⁰, and also if it occurs in the evening. Again, if when the south wind²⁷¹

²⁴⁹De Signis 30. Compare Th., De Ventis 10.58.

²⁵⁰Th., De Ventis 4.25 seems to say in one breath that the Nile is the sole example of this and in the next to make a generalization that includes rivers in Libya, Babylonia, and Sousa. See also Th., De Ventis 6.46; Ammianus Marcellinus 22.15.13.

²⁵¹Frontinus, Strategemata 2.2.7. <See note 85, above. C.K.>.

²⁵²Arist., Met. 2.4, 360 b, 361 b. Compare Th., De Ventis 8.50.

²⁵³Th., De Signis 34. Compare Arist., Prob. 26.3.

²⁵⁴Prob. 26.23. See also Th., De Ventis 6.36.

²⁵⁵See also Lydus, De Ostentis 4. ²⁵⁶Th., De Signis 31.

²⁵⁷2.120.

²⁵⁸See also Aratus, Phaenomena 924-925; Geoponica 1.3.3, 1.11.8.

²⁵⁹Th., De Signis 32-33 (A. Hort's translation, in The Loeb Classical Library). See also Pliny 18.354.

²⁶⁰See also Pliny 18.354.

²⁶¹See also Aratus, Phaenomena 933-937; Vergil, Georgics 1.

²⁶²370-373, and Servius there, on 370; Geoponica 1.3.3.

²⁶³Compare Arist., Prob. 26.20. See also an interesting note in

R. C. Jebb's edition of the Ajax of Sophocles, Appendix, 223-224

(Cambridge, at the University Press, 1896).

²⁴⁹Plutarch, Themistocles 14.2 (B. Perrin's translation, in The Loeb Classical Library).

²⁵⁰Thucydides 2.83-84. For other examples of familiarity with local conditions see Plutarch, Marius 37.3; Procopius 8.4.10. Polybius 4.44 is interesting in contrasting the aid afforded by the winds to those sailing to and from Brundisium with the difficulties it presented to those sailing to and from Chalcedon.

²⁵¹Nemea 7.17. Compare Vegetius 4.41 Aer vero et mare ipsum nubiumque magnitudo vel species sollicitos instruit nautas.

²⁵²Th., De Ventis 6.35.

²⁵³Th., De Signis 35. <For "sunwise" see above, note 23a.

C. K.>. ²⁵⁴Pliny 18.339. ²⁵⁵5.7. ²⁵⁶Th. De Signis 34. ²⁵⁷18.339.

is blowing at early dawn, there is lightning from the same quarter, it indicates rain or wind. When the west wind is accompanied by lightning from the north, it indicates either storm or rain. Lightning in the evening in summer time indicates rain within three days, if not immediately. Lightning from the north in late summer is a sign of rain²⁷².

Signs of wind are swelling seas, moaning billows, far-resounding beaches, murmuring crags and promontories, and echoing woods²⁷³. An explanation of the sounds that herald a south wind is given by Aristotle²⁷⁴:

When a south wind is going to blow there is a premonitory indication: a sound is heard in the places from which the eruptions²⁷⁵ issue. This is because the sea is being pushed on from a distance and its advance thrusts back into the earth the wind that was issuing from it. The reason why there is a noise and no earthquake is that the underground spaces are so extensive in proportion to the quantity of the air that is being driven on that the wind slips into the void beyond.

Modern descriptions of the sounds that precede storms from the seas are not less picturesque than ancient accounts. Washington Irving gives a vivid account of a rising storm encountered by Columbus²⁷⁶ in the *New World*:

One of those tremendous hurricanes which sometimes sweep those latitudes had gradually gathered up. The baleful appearance of the heavens, the wild look of the ocean, the rising murmur of the winds, all gave notice of its approach.

A passage in Thoreau²⁷⁷ is so illuminating that it deserves quotation in full:

...a sudden loud sound from the sea, as if a large steamer were letting off steam by the shore... The old man said that this was what they called the "rut," a peculiar roar of the sea before the wind changes, which, however, he could not account for. He thought that he could tell all about the weather from the sounds which the sea made.

Old Josselyn, who came to New England in 1638, has it among his weather-signs that "the resounding of the sea from the shore, and murmuring of the winds in the woods, without apparent wind²⁷⁸, sheweth wind to follow."

Being on another part of the coast one night since this, I heard the roar of the surf a mile distant, and the inhabitants said it was a sign that the wind would work round east, and we should have rainy weather. The ocean was heaped up somewhere at the eastward, and this roar was occasioned by its effort to preserve its equilibrium, the wave reaching the shore before the wind. Also the captain of a packet between this country and England told me that he sometimes met with a wave on the Atlantic coming against the wind, perhaps in a calm sea, which indicated that at a distance the wind was coming from an opposite quarter, but the undulation had traveled faster than it.

²⁷²The passage quoted in the text is to be found in Th., *De Signis* 21 (A. Hort's translation).

²⁷³Aratus, *Phaenomena* 909-912; Th., *De Signis* 20; *Geoponica* 1.11.7; Vergil, *Georgics* 1.356-359, *Aeneid* 10.98-99 and Servius on 98; Lucretius 2.764-767; Cicero, *De Divinatione* 1.13; Pliny 18.359-360; Seneca, *Agamemnon* 487-489. Almost all these passages are quoted in full by A. S. Pease, *M. Tulli Ciceronis De Divinatione*, VI, pages 79-80 (University of Illinois Studies in Language and Literature, VI, VIII). Lucan 5.571-572 makes the boatman Amyclas say to Caesar as they prepare to cross the Adriatic Sea: *si murmur ponti consulimus, Cauri verrunt mare*.

²⁷⁴Arist., *Met.* 2.8, 367 a (E. W. Webster's translation).

²⁷⁵I, e. from winds that move beneath the surface of the earth.

²⁷⁶Columbus, Book XV, Chapter I.

²⁷⁷The *Wellfleet Oysterman*, Cape Cod, 114-116 (Riverside edition).

²⁷⁸Compare Aratus, *Phaenomena* 911.

A far different, but no less picturesque, vocabulary is used by Du Bose Heyward²⁷⁹ to describe the noises of the storm-bringing wind:

At one o'clock the tension snapped. As though it had been awaiting St. Christopher's chimes to announce "Zero Hour," the wind swung into the east, and its voice dropped an octave, and changed its quality. Instead of the complaining whine, a grave, sustained note came in from the Atlantic, with an undertone of alarming variations, that sounded oddly out of place as it traversed the inert waters of the bay.

Slowly the threatening undertone of the wind grew louder. Then, as though a curtain had been lowered across the harbor mouth, everything beyond was blotted out by a milky screen.

A picturesque name for a sound made by the sea is 'calling of the sea':

A murmuring or roaring noise, sometimes heard several miles inland during a calm, in the direction from which the wind is about to spring up, and is known as the calling of the sea²⁸⁰.

... If at sea during a wind there is a sudden calm, it indicates a change or an increase of wind. If promontories seem to stand high out of the sea²⁸¹, or a single island looks like several, it indicates a change to south wind. If the land looks black from the sea, it indicates a north wind, if white, a south wind²⁸².

... The ebb-tide indicates a north wind, the flowing tide a wind from the south. For, if the flowing sets from the north, there is a change to the south, and if an ebb-tide comes from the south, there is a change to the north²⁸³.

Waves rising higher than usual signified the advent of winds²⁸⁴.

Interesting signs of wind are provided by living things. If a pilot sees cranes turn and fly in the opposite direction, he knows that wind is threatening from the quarter toward which they had been going²⁸⁵. Winds come from the direction in which dolphins appear²⁸⁶. It is still believed by seamen in the Aegean that dolphins show the direction of the next wind or of the wind on the following day²⁸⁷. Many similar signs of wind derived by the ancients from the actions and the habits of animals both by sea and by land are listed in THE CLASSICAL WEEKLY 14.97-98.

Modern illustrations of signs of wind given by animal life are not hard to find. There is a Louisiana belief²⁸⁸ that

Roosters resting on a tree limb always roost with their heads pointing in the direction in which the wind will blow the next morning.

²⁷⁹Porgy, 142-143 (New York, George H. Doran Company, 1925).

²⁸⁰Richard Inwards, *Weather Lore: A Collection of Proverbs, Sayings, and Rules Concerning the Weather*, 127 (London, Elliot Stock, 1898). The quotation is exact.

²⁸¹Compare Arist., *Met.* 3.4, 373 b, *Prob.* 26.53. In reporting the successful crossing of the English Channel by a swimmer starting from France a newspaper dispatch said: "At 8 o'clock the wind had freshened and we could plainly see the sands of South Forland on the English side, which was a bad sign, as such conditions usually presage a high wind."

²⁸²The passage "If at sea... a south wind" is to be found in Th., *De Signis* 31 (A. Hort's translation, in The Loeb Classical Library).

²⁸³*Ibidem*, 29 (A. Hort's translation).

²⁸⁴Th., *De Signis* 6.35; Pliny 18.359.

²⁸⁵Aelian, *De Natura Animalium* 3.14. Compare 7.7.

²⁸⁶Alciphron 1.10; Artemidorus 1.16 (page 110 of R. Hercher's edition, Leipzig, Teubner, 1864); Pliny 18.361; Bede 36. See also THE CLASSICAL WEEKLY 14.98.

²⁸⁷Erhard, *Fauna der Cykladen*, 1.27 (Leipzig, Voigt und Gunther, 1858).

²⁸⁸Journal of American Folk-Lore 40 (1927), 200, No. 1385.

See also 201, No. 1397.

I quote the following paragraph from a newspaper article²⁸⁹:

Just before a hurricane there invariably arrive off the Caribbean coasts vast numbers of these weather-wise birds that are called in Dominica 'Twa-oo,' from their peculiar cry. These birds are regarded locally as sure harbingers of the dreaded tropical storms. They only appear during the calms immediately before the wind and rain break loose in all their fury. They cover the rocks in large flocks, coming in from the desolate sandy islands where they breed. American bird books call them the 'sooty tern,' but they are known to the natives as 'hurricane birds.'

A most remarkable tale, interesting either as fact or as fiction, is told of the Seminoles of Florida²⁹⁰:

Four weeks before the hurricane struck Palm Beach and the east coast of Florida last September <1928>, the Seminole Indians of the Okeechobee Band prophesied the disaster. They vividly described the velocity of the coming wind, specified the depth of water which would sweep the Everglades, and warned of general destruction and appalling loss of life.

No quibbling marked their predictions. The blossoming of the saw grass first attracted their attention. This blossoming was out of season, and untimely blooming of this Everglades grass has been for centuries a signal to the Seminoles to stop, look, and listen.

They sensed a certain tenseness in the stillness which hung over the 'glades; the smaller birds stopped singing and chirped nervously, and their flights were short and furtive—their general drift was northward and westward. The great buzzards, too, were apprehensive and seemed to group themselves as though in consultation. Instead of taking their usual great, gliding flights, they went aloft and nervously beat the air—their drift was northward and westward. The alligators barked with unusual frequency and exposed themselves recklessly, moving in great numbers toward deeper waters. The water snakes moved with them. Meadow rats and rabbits began a trek along the roads and trails, northward and westward, squeaking and grunting irritably, making little effort to hide their movement. Crickets signaled a warning to those who

would listen. This was enough. The Seminoles had read the 'signs'.

Having read the 'signs', the Seminoles prepared a brief migration into the land of their brothers, the Tallahasseees, far to the north and west of their own threatened territory. Before leaving they urged their white friends to follow them to safety. . . . Insofar as is known, not a single Seminole was lost in the storm.

A friend of mine who crossed the Everglades in the middle of the summer of 1929 heard that the Seminoles had warned the white people of impending storm because of the blooming of a plant out of season and because of the restlessness of alligators. In the early fall there were storms to the south of Florida, but most of their fury was spent before they reached Florida.

Theophrastus lists still other miscellaneous signs:

Again²⁹¹, if the wind is from the south, the snuff of the lamp-wick indicates rain; it also indicates wind in proportion to its bulk and size: while if the snuff is small, like millet-seed, and of bright colour, it indicates rain as well as wind. Again, when in winter the lamp rejects the flame but catches, as it were, here and there in spurts²⁹², it is a sign of rain: so also is it, if the rays of light leap up on the lamp, or if there are sparks.

Some say²⁹³ that, if in the embers there is an appearance as of shining hail-stones, it generally prognosticates hail²⁹⁴; while, if the appearance is like a number of small shining millet-seeds, it portends fair weather, if there is wind at the time, but, if there is no wind, rain or wind.

One recalls in this connection that Aeolus foretold the rising winds by observing fire²⁹⁵.

The cracking sounds made by glued articles when the south wind was blowing indicated a change to the north wind²⁹⁶.

(To be concluded)

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²⁸⁹The Detroit News, Sunday, June 9, 1929, Feature-Fiction Section, page 14.

²⁹⁰Clarence E. Bosworth, Red Signs and White Science: How the Seminoles Read the Signs of Nature and Escaped the Recent Tropical Hurricane, American Forests and Forest Life 35 (1929), 85-88. The passages quoted in the text appear on pages 85-86.

²⁹¹For this passage see Th., De Signis 14 (A. Hort's translation).

²⁹²Compare Vergil, Georgics 1.392; Pliny 18.358.

²⁹³Th., De Signis 25 (A. Hort's translation).

²⁹⁴Aratus, Phaenomena 1041-1043.

²⁹⁵Diodorus Siculus 5.7.7. See also THE CLASSICAL WEEKLY 18.156, 23.6. Interesting, too, is Pliny 18.358.

²⁹⁶Arist., Prob. 1.24. Compare Th., De Signis 30.



Greek and Roman Weather Lore of Winds (Concluded)

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Reviewed work(s):

Source: *The Classical Weekly*, Vol. 24, No. 4 (Oct. 27, 1930), pp. 25-29

Published by: [Classical Association of the Atlantic States](#)

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The Classical Weekly

VOL. XXIV, No. 4

MONDAY, OCTOBER 27, 1930

WHOLE No. 641

GREEK AND ROMAN WEATHER LORE OF WINDS

(Concluded from page 24)

ASTROLOGY AND ASTRO-METEOROLOGY

It is a cardinal principle of ancient superstition that changes in the phases or conditions of heavenly bodies bring changes upon earth, among which are included the vagaries of the weather. The Chaldeans held that planets by their rising and setting and sometimes by their colors foreshadowed, among other things, great winds (hurricanes?), tempestuous rains, and droughts²⁹⁷. At the beginning of every year Indian philosophers predicted droughts, winds, and rain²⁹⁸, though we are not told that heavenly bodies were observed by them. Among the Romans the planet Mars had a reputation for abounding in winds and fitful flashes of lightning²⁹⁹. Plutarch tells how the quenching of heavenly bodies that looked like fire caused unusually violent winds³⁰⁰.

There is extant a systematic prediction of the kinds of weather that will ensue when Jupiter is in each 'house' of the zodiac³⁰¹. I give as a sample the influence of Jupiter in Gemini in the 'house' of Hermes. The prevailing winds will be Notus and Liba. The winter will begin windy, change to temperate in the middle, and become frosty and windy at the end. The spring will be mild, with light rains. The summer will be temperate on account of the brisk blowing of the etesian winds for a long time. In the fall there will be damaging hail³⁰².

With the confidence and assurance of a modern almanac Eudoxius (Eudoxus?) made a twelve-year weather calendar in which he predicted, sometimes for the entire year, the general type of weather that one was to expect. He based his forecasts upon the presence of the moon in the various signs of the zodiac on the fourteenth of June and the twentieth of July³⁰³. If, for instance, the moon be found in Gemini on the twentieth of July, Lips will dominate the year, though other winds will mingle with it. The winter will start damp and windy, change to temperate in the middle, and end frosty and windy. During the next summer etesian winds will blow³⁰⁴.

Among the changes of weather that are listed in various star-catalogues as attending the rising and the setting of stars the wind receives much prominence³⁰⁵.

A great deal of this material is conveniently collected and arranged in composite star-calendars in Daremberg et Saglio, *Dictionnaire des Antiquités Grecques et Romaines* (s. v. *Calendarium*, Volume I, Part 2, 836-849). An important reference for this section of my paper is Julius Röhr, *Beiträge zur Antiken Astro-meteorologie*, *Philologus* 83 (1928), 259-305.

THE HUMAN BAROMETER

Winds may bring pleasure and prosperity or they may cause discomfort and even adversity. The ideal living conditions supposed to exist in the Islands of the Blest off the coast of Spain were attributed in no small measure to beneficent winds laden with dew³⁰⁶. One may compare with this the salutary effects produced by a wind in the western part of North America, the chinook, which has been described³⁰⁷ as "an ever-welcome guest, whose coming is indicative of good, and whose absence would be a momentous evil".

Theophrastus³⁰⁸ notes that we are responsive to changing conditions of the atmosphere and that they make themselves felt in advance of the winds they portend.

Swelling of the feet indicated to a Greek a change to a south wind or, sometimes, a hurricane. A shooting pain in the right foot might signify the same thing³⁰⁹. Some of Joseph C. Lincoln's characters were even better barometers than were the Greeks. One of them, who was taken to sea because of his ability to forecast the weather, was reluctant to admit that humble things like bones provided him with second weather sight. When he was pressed to tell what particular bones gave him his clues he replied³¹⁰:

Why, my laig bones mostly. If a no'theaster's comin' my right laig sort of aches, and if it's a sou'-easter it'll fetch me in the left one. Then there's other—

An unsympathetic roar of laughter interrupted him. A few days later the captain disdainfully informed him of a Government prediction of a gale. The seer remonstrated³¹¹:

"Now, Cap'n Ez," he protested in an aggrieved tone, "ain't I been tryin' to git at you or Brad for four days or more? I know there was a blow comin'. She's come a-bilin', too. And I don't need no specs nuther."

One of Lincoln's short stories, *The South Shore Weather Bureau*³¹², is based on similar ability of another seer:

"Wall," drawls Beriah, "now to-day looks fine and clear, don't it? But last night my left elbow had

²⁹⁷Diodorus 2.30.4-5.

²⁹⁸*Ibidem*, 2.40.2.

²⁹⁹Lucan 10.206.

³⁰⁰Plutarch, *Lysander* 12.7.

³⁰¹Geoponica 1.12.

³⁰²*Ibidem*, 1.12.12-17.

³⁰³Catalogus Codicum Astrologorum Graecorum, 7.183-187. On page 182 the opinion is expressed that 'Eudoxius' is the same as Eudoxus of Cnidos.

³⁰⁴*Ibidem*, 183-184. Astrological lore of the winds is to be found in the same volume, on pages 156, 158, 159, 160, 165, 166. Other volumes in this publication give still other lore of the winds, chiefly in connection with thunder-calendars. I have listed some astrological weather lore in *THE CLASSICAL WEEKLY* 20.46-47, 22.30, 36.

³⁰⁵See, for example, *Gemini Elementa Astronomiae*, edited by Carolus Manitius, 210-233 (Leipzig, Teubner, 1898); *Claudii Ptolemaei Opera Quae Extant Omnia, Opera Astronomica Minora*, edited by J. L. Heiberg, 2.1-67 (Leipzig, Teubner, 1907).

³⁰⁶Plutarch, *Sertorius* 8.2-3. See also *Odyssey* 4.566-567.

³⁰⁷A. T. Burrows, *The Chinook Winds*, *Journal of Geography* 2 (1903), 136. <For the Chinook Wind see also above, page 19, column 2. C. K.>

³⁰⁸*De Ventis* 6.35.

³⁰⁹*Th.*, *De Signis* 30.

³¹⁰Joseph C. Lincoln, *Partners of the Tide*, 311-312 (New York, A. L. Burt Co., 1905).

³¹¹*Ibidem*, 376.

³¹²Pages 55-73 of *Cape Cod Stories* (New York, A. L. Burt Co., 1907). The quotation will be found on page 59.

rheumatiz in it, and this morning my bones ache, and my right toe-joint is sore, so I know we'll have an easterly wind and rain this evening. If it had been my left toe, why —"

In *Scarlet Sister Mary* 299³¹³, the observation is made that "Worry-ation makes a misery worse dan east rain an' wind".

Samuel Butler is worth quoting on this aspect of weather lore³¹⁴:

For as old sinners have all points
O' th' compass in their bones and joints,
Can by their pangs and aches find
All turns and changes of the wind;
And better than by Napier's bones,
Feel in their own the age of moons. . . .

The ill effects of the south wind upon the human body are frequently noted. Theophrastus says that, during the prevalence of this wind, men felt more sluggish and less efficient, but the north wind made them energetic³¹⁵. Again, the south wind brought fevers³¹⁶ and affected the health in other ways³¹⁷.

The wind should be taken into account in town-planning. Examples of what not to do were numerous.

For example, Mytilene in the island of Lesbos is a town built with magnificence and good taste, but its position shows a lack of foresight. In that community when the wind is south, the people fall ill; when it is northwest, it sets them coughing; with a north wind they do indeed recover but cannot stand about in the alleys and streets, owing to the severe cold³¹⁸.

Similar reactions to the weather are still being felt³¹⁹:

Giordani felt storms coming four days in advance; Diderot said, 'It seems to me that I go crazy when the wind blows violently.' Maine de Biran said, 'In bad weather my mind and my will are not the same as when it is fine.' Alfieri wrote, 'I am like a barometer; I have always experienced, more or less, a greater ease of composition according to the atmospheric pressure; absolute stupidity when the great winds of the solstices and the equinoxes are blowing, an infinitely less penetration in the evening than in the morning.'

The comments of the ancients about the depressing effects of winds from across the Mediterranean will be borne out by anyone who has visited the classical lands in summer. Captain Smyth³²⁰ thus describes the sirocco as felt in Sicily:

The sirocco generally continues three or four days, during which period such is its influence, that wine cannot be fined³²¹, or meat effectually salted; oil paint, laid on whilst it continues, will seldom harden, but dough can be raised with half the usual quantity of leaven, and though blighting in its general effects in summer, it is favourable to the growth of several useful plants in winter. This wind is peculiarly disagreeable at Palermo, a city situated in a plain in the north-west part of the island, surrounded on the land side by

mountains, which collect the solar rays as if to a focus. Although inured to the heat of the East and West Indies, and the sands of Arabia and Africa, I always felt, during a sirocco, more incommoded by an oppressive dejection and lassitude than in those countries. At such times the streets are silent and deserted, for the natives can scarcely be prevailed on to move out while it lasts³²², and they carefully close every window and door of their houses, to exclude it.

The effects of the norther, a wind in the western part of our own country, are thus pictured³²³:

Human beings suffer from nervousness and headaches and become irritable and impatient. It is said that in the early days in California if a murder or any personal violence resulted from a quarrel which occurred during a norther that fact was taken into account as an extenuating circumstance. During a norther cattle are restless and cows are reported to give less milk than usual.

Captain Wm. H. Smyth's description³²⁴ of the rôle of the winds in Sicilian weather is both pertinent to classical study and interesting:

Whilst the sun is in the northern signs, the sky, although it seldom assumes the deep blue tint of the tropics, is, nevertheless, beautifully clear and serene; but after the autumnal equinox, the winds become boisterous, and the atmosphere hazy and dense; the dews and fogs increase, particularly on the coasts, and the rain falls in frequent and heavy showers.

In summer it is generally calm early in the morning, but a breeze springs up about nine or ten o'clock, freshens until two or three, and gradually subsides again into a calm towards evening. The winds are variable both in their force and their direction. The most prevalent are the northerly and westerly, which are dry and salubrious, producing, with the clearest sky, the most refreshing sensations. Those from the east round to southerly are heavy, and loaded with an unwholesome mist, often accompanied with heavy rain, thunder, and lightning, during which the luminous meteor, called by seamen *campasani*, (a corruption of *Corpo Santo*) is sometimes seen, and hailed with similar ideas to those which inspired the ancients on the appearance of their Castor and Pollux.

About the time of the vernal equinox, the force of the south-west wind is very sensibly felt along the shores of Trapani, Marsala, Mazzara, and Girgenti; but as the season advances the winds blow more from the northward, with fresh gales at intervals, which, however, are seldom experienced with violence in bays or harbours, and their power rarely continues longer than forty hours. The most experienced pilots say, that storms which commence in the day-time are more violent, and of longer duration than those which start up during the night.

REMARKABLE STORMS

Antiquity, like modern times, experienced storms which surpassed all previous storms within the memory of the oldest inhabitants. In the neighborhood of Ilerda in 49 B. C. Caesar's men encountered one so great that it was evident that there had never been a greater deluge of water in those places³²⁵. During a battle between Lucullus and Mithridates "a tempest of wind, the like of which had not been known in the

³¹³By Julia Peterkin (Indianapolis, The Bobbs-Merrill Co., 1928).

³¹⁴Hudibras, Part 3, Canto 2, 405-410.

³¹⁵De Ventis 10.56-59.

³¹⁶Arist., Prob. 1.23, 26.50; Th., De Ventis 10.57.

³¹⁷Arist., Prob. 1.24, 26.42. The general subject is discussed at considerable length by Hippocrates, De Aere, Aquis, et Locis, Chapters 1-6; Vitruvius 1.6.1-3; Celsus 2.1.

³¹⁸Vitruvius 1.6.1 (M. H. Morgan's translation [Harvard University Press, 1914]).

³¹⁹So The Literary Digest for August 7, 1926, page 21, quoting La Liberté (no date is given). It is with some misgiving that I quote from an unscholarly secondary source.

³²⁰Smyth (as cited in note 53), 5.

³²¹Compare Pliny 18.329 illinc <i.e. from the south> flatu veniente materiam vinumque, agricola, ne tractes.

³²²Compare Pliny 18.330 De ipsa regionis eius hora praemonuisse conveniat. Frondem medio die, arborator, ne caedito. Cum meridiem adesse senties, pastor, [aestate] contrahente se umbra, pecudes a sole in opaca cogito.

³²³R. DeC. Ward, The Climates of the United States, 417 (Boston, Ginn and Co., 1925).

³²⁴Smyth (as cited in note 53), 4-5.

³²⁵Caesar, De Bello Civili 1.48.1.

memory of man, tore down the tents of both, swept away the beasts of burden, and dashed some of their men over the precipices. Both sides then retreated for the time"³²⁶. Octavian's fleet was destroyed in 38 B. C. by a storm in which wind played a devastating part. It was entirely without parallel in the region of the straits of Sicily³²⁷.

Queer turns were sometimes given to accounts of weather in foreign countries. Diodorus³²⁸ thus describes the pranks of the wind in Gaul:

There happens throughout most of Gaul a strange and miraculous thing which we think it unseemly to pass by in silence. From the west and the north winds are wont to blow with such violence and power that they sweep from the ground stones as large as one can hold and a coarse cloud of pebbles. In the general violence of the storm they tear weapons and clothes from men and riders from horses.

The wind might be endowed with even greater magical properties³²⁹:

For in Dalmatia... a wind of great violence and exceedingly wild is wont to fall upon the country, and when this begins to blow, it is impossible to find a man there who continues to travel on the road, but all shut themselves up at home and wait. Such, indeed, is the force of the wind that it seizes a man on horseback together with his horse and carries him through the air, and then, after whirling him about in the air to a great distance, it throws him down wherever he may chance to be and kills him.

RAINS OF ANIMALS AND THINGS

To the power of the wind may be ascribed the superstitious belief in showers of various things, animate and inanimate, which are a subject of perennial interest, as is shown by rather frequent items in newspapers³³⁰. As often as they occur, their real nature is explained, sometimes with long lists of similar phenomena. Though superstitions about them continue and are widespread, they do not flourish with the vigor they attained in ancient Greece and ancient Italy, where rains of blood, milk, chalk, ashes, earth, animals, and miscellaneous objects struck awe into the hearts of even the educated. The most casual reading of Livy will reveal the dread which such events aroused³³¹. Occasionally, however, they might portend blessings. During performances in the theater in the consulship of Quintus Metellus and Titus Didius (98 B. C.) it rained chalk, an occurrence that signified welcome rains and good crops³³².

The literature on this general subject is voluminous³³³. It is my aim at this time merely to show that

some of the ancients knew that these terrifying phenomena were to be explained on physical grounds. The inclusion of the subject here is justified simply because the wind (or a wind-driven cloud) is the carrying agent.

A scholium on Homer³³⁴ states that on an occasion when there was a great war clouds picked up the bloody water in neighboring rivers and scattered it as bloody dew. This explanation is remarkable in that it removes the occurrence from the realm of the supernatural.

Pliny³³⁵ knew that stones and many other things were carried by the wind. In his account of the wanderings in Africa of the force under Cato the Younger Lucan³³⁶ shows that he understood perfectly well the nature of the phenomenon:

Galeas et scuta virorum
pilaque contorsit violento spiritus actu
intentusque tulit magni per inania caeli.
Illud in externa forsan longaque remota
prodigium tellure fuit, delapsaque caelo
arma timent gentes, hominumque erepta lacertis
a superis demissa putant. Sic illa profecto
sacrificio cecidere Numae, quae lecta iuventus
patricia cervice movet: spoliaverat Auster
aut Boreas populos ancilia nostra ferentis.

Procopius³³⁷ tells how ashes from Vesuvius rose to great heights and were borne by the winds to lands very far away.

And once, they say, they fell in Byzantium³³⁸ and so terrified the people there, that from that time up to the present the whole city has seen fit to propitiate God with prayers every year; and at another time they fell on Tripolis in Libya.

I am adding two references to the enormous literature of this subject. The first was written by a keen observer of things Sicilian, Captain Wm. H. Smyth³³⁹:

Waterspouts, and various singular meteoric phenomena, occur. Among the latter, on a warm, cloudy, hazy, day, the 14th of March, 1814, it began to rain in large drops, that appeared muddy, and they deposited a very minute sand of a yellowish-red colour. The wind, on the day before, had been blowing strongly from the south-south-west to the north-east, and during the time the rain fell was from the south-west, which leads to a supposition that it was transported from the deserts of Africa, though the first impression on the minds of the people in Messina, was, that an eruption of Mount Aetna had occurred.

R. C. Andrews³⁴⁰ has an interesting comment on a dust storm in China:

instances of rains of small toads and fishworms see Journal of American Folk-Lore 31 (1918), 10.

An interesting addition to the literature of this subject is G. Bidault de l'Isle, La Pluie de Sang du 30 Octobre 1926, La Nature 54 (1926), Supplément de Novembre 27, 189. The conclusion is reached that the coloring matter of such rains in France and elsewhere in Southern Europe has been carried from the deserts of Africa.

The limitless numbers in which flights of insects may gather, to be blown away to destruction, is well illustrated by a passage in Charles Darwin, The Voyage of the Beagle (Harvard Classics, 29, 172): "One evening, when we were about ten miles from the bay of San Blas, vast numbers of butterflies, in bands or flocks of countless myriads, extended as far as the eye could range. Even by the aid of a telescope it was not possible to see a space free from butterflies. The seamen cried out, 'it was snowing butterflies', and such in fact was the appearance."

³³⁴Scholium A on Iliad 11.53-54 (Dindorf's edition, 1.374).
³³⁵2.104.
³³⁶6.4.26-27 (H. B. Dewing's translation, in The Loeb Classical Library).

³³⁷In 472 A. D. ³³⁸Smyth (as cited in note 53), 6.
³³⁹On the Trail of Ancient Man, 24 (New York, Putnam, 1926).

³²⁶Appian, Romana Historia 12.88 (H. White's translation, in The Loeb Classical Library).

³²⁷Appian, Bella Civilia 5.90. ³²⁸5.26.1.

³²⁹Procopius 5.15.5-6 (H. B. Dewing's translation, in The Loeb Classical Library).

³³⁰The Chicago Tribune, for instance, devoted almost a column to the subject in its issue of April 17, 1927. The article is very valuable.

³³¹Livy 1.31.1-2; 3.10.6; 7.28.7; 10.31.8; 21.62.5; 22.1.9; 22.36.7; 24.10.8; 25.7.7; 26.23.5; 27.11.5; 27.37.1; 28.27.16; 29.10.4; 29.14.4; 30.38.8-9; 34.45.7-8; 35.9.4; 35.21.4; 36.37.3; 39.46.5; 40.19.2; 42.2.4; 42.20.5; 43.13.4; 44.18.6. Julius Obsequens likewise frequently mentions showers of various things.

³³²Julius Obsequens 47 (107).

³³³Numerous references have been collected by A. S. Pease, M. Tulli Cicronis De Divinatione, VI, 273-274 (University of Illinois Studies in Language and Literature, VI, VIII). In Transactions and Proceedings of the American Philological Association 51.112. I have collected a few references to showers of animals. For modern

The dust reached as far south <of Peking> as Shanghai and its yellow blanket hovered over the sea sixty-five miles beyond the coast. It came from a land parched by fourteen well-nigh rainless months which had cut a heavy toll of human life.

The wind manifests its power in other ways, notably in affecting water levels, which are sometimes raised and sometimes lowered. Many examples of this have been given in *THE CLASSICAL WEEKLY* 19.83-84, 126, 21.193, 22.40³⁴¹. When the north winds forced the waters back before Alexander as he was leading a brigade beyond Phaselis in Pamphylia, the impression was created that Heaven was helping the youthful conqueror³⁴².

RELIGION AND MAGIC

Naturally religion and magic play an important part in weather lore. Prayers and offerings³⁴³ were made to winds, and even altars³⁴⁴ and temples³⁴⁵ were erected in their honor. In return for their providential aid against the enemies of Thurii and Megalopolis the people of these cities conferred citizenship upon them³⁴⁶.

Like witches and magicians, deities were able to arouse the fury of the winds or to pacify them and to direct them for good or ill, as I have shown by many examples in a previous paper, *Magic and the Weather*, *THE CLASSICAL WEEKLY* 18.154-157, 163-166³⁴⁷. At this time I merely wish to add an ancient and a modern example of the retributive power of the winds. In the Homeric Hymn to Dionysus³⁴⁸ the pirates are represented as being afraid to do violence to the deity lest he stir up dangerous winds and heavy squalls. The Ancient Mariner was not so far-sighted in his treatment of the albatross³⁴⁹:

And I had done a hellish thing,
And it would work 'em woe:
For all averred, I had killed the bird
That made the breeze to blow.
Ah wretch! said they, the bird to slay,
That made the breeze to blow!

HIGH MOUNTAINS

Storms were supposed to be restricted to regions comparatively near the earth. Thus Aristotle tells us³⁵⁰ that on very high mountains such as Athos there were no winds. As proof he states that ashes of sacrifices on this mountain were undisturbed from one year to another. Plutarch held similar views³⁵¹, for he says that some mountains reach up into an air that is pure and free from moisture, so that upon their tops there is no cloud nor dew nor mist. Lucan adds³⁵² the thunderbolt to the list of things that belong to the lower regions:

fulminibus propior terrae succenditur aer
imaque telluris ventos tractusque coruscus
flammarum accipiunt: nubes excedit Olympus
lege deum. Minimas rerum discordia turbat,
pacem summa tenent³⁵³.

Goldsmith's Deserted Village has been aptly quoted in connection with this passage of Lucan³⁵⁴:

As some tall cliff that lifts its awful form,
Swells from the vale and midway leaves the storm,
Though round its breast the rolling clouds are spread,
Eternal sunshine settles on its head.

CAVES

Since the ancients believed in the existence of underground winds³⁵⁵, it is but natural that they should think of some of them as issuing from caves. Nemesianus refers³⁵⁶ to Thracian Boreas as coming from a cave, and an anonymous poem speaks of Circius as thundering in a cave³⁵⁷. At Senta, in Dalmatia, there was a wide-mouthed cave from which issued a whirlwind whenever a light object was thrown into it. It made no difference how tranquil the day might be³⁵⁸. In the Egyptian city of Thebes there was a cave in which calm prevailed on the thirtieth day (of the month), but on the other days there was wind³⁵⁹. The great troglodyte meteorologist was of course Aeolus³⁶⁰. I have twice referred to his activities in previous papers on weather lore³⁶¹.

WIND CYCLES

The ancients too had theories about cycles of weather. In the Bible³⁶² one reads that

The wind goeth toward the south, and turneth about unto the north; it whirleth about continually, and the wind returneth again according to his circuits.

The Bible does not tell how long it takes the wind to do this, but Eudoxus is more specific. According to Pliny³⁶³, Eudoxus thought that the winds and the weather in general had a cycle of four years. In my concluding paper I shall give references to wider aspects of this subject.

MODERN REFERENCES

In this paper I have given but few references to modern lore. Many examples of sayings and beliefs about the winds are gathered together by Richard Inwards, *Weather Lore: A Collection of Proverbs, Sayings and Rules Concerning the Weather*³, 79-90³⁶⁴, and by Fletcher S. Bassett, *Legends and Superstitions of the Sea and of Sailors in All Lands and at All Times*, 101-147³⁶⁵. Compare also Edward B. Garriott, *Weather Folk-Lore and Local Weather Signs*, 6-8³⁶⁶; T. Morris

³⁴¹See also Lucretius 6.112-720; Cassius Dio 39.61.1.

³⁴²Arrian, *Anabasis* 1.26.

³⁴³Paul Stengel, *Der Kult der Winde, Opferbräuche der Griechen*, 146-153 (Leipzig and Berlin, 1910).

³⁴⁴Pausanias speaks (9.34.3) of an altar to the winds at Coronea.

³⁴⁵Seneca 5.17.4; Greek Anthology 6.53.

³⁴⁶Aelian, *Varia Historia* 12.61; Pausanias 8.27.14, 8.36.6.

³⁴⁷I should like to add a reference to W. R. Roscher, *Ausführliches Lexikon der Griechischen und Römischen Mythologie*, Hermes als Wind- und Luftgott, Volume 1, Part 2, 2360-2362.

³⁴⁸Homeric Hymn 7.22-24.

³⁴⁹Coleridge, *The Rime of the Ancient Mariner*, Part II, Stanza 3. See J. L. Lowes, *The Road to Xanadu*, 224-228 (Boston and New York, Houghton Mifflin Company, 1927).

³⁵⁰Arist., *Prob.* 26.36.

³⁵¹Moralia 951 B. See also Odyssey 6.43-45; Lucretius 3.18-22.

³⁵²2.269-273.

³⁵³Compare Seneca, *Dialogi* 5.6.1. Pars superior mundi et ordinatio ac propinqua sideribus nec in nubem cogitur nec in tempestatem impellitur nec versatur in turbine. Omni tumultu caret; inferiora fulminantur.

³⁵⁴By C. E. Haskins, in his edition of the *Pharsalia*, page 52 (London, George Bell and Sons, 1887).

³⁵⁵See, for example, Pliny 2.114.

³⁵⁶Incerti Versus De Duodecim Ventis 6.

³⁵⁷Antigonos, *Historia Mirabilium* 126 (139).

³⁵⁸Vergil, *Aeneid* 1.50-63; Ovid, *Metamorphoses* 1.262-264.

³⁵⁹*THE CLASSICAL WEEKLY* 18.156, 23.6.

³⁶⁰Ecclesiastes 1.6.

³⁶¹2.130.

³⁶²London, Elliot Stock, 1898.

³⁶³Chicago and New York, Belford, Clarke and Co., 1885.

³⁶⁴United States Department of Agriculture, Weather Bureau, Washington, 1903.

Longstreth, Reading the Weather, 76-86³⁶⁷; D. E. Marvin, Curiosities in Proverbs, 212-214³⁶⁸; O. Freiherr von Reinsberg-Duringsfeld, Das Wetter im Sprichwort, 41-45³⁶⁹; C. Swainson, A Handbook of Weather Folk-Lore, 218-228³⁷⁰; Edward Vernon, Is It Going to Rain?, 2 63-66, 71-73³⁷¹. For such popular signs as are dependable the reasons are given by W. J. Humphreys, Weather Proverbs and Paradoxes, 59-63³⁷².

The wind has, of course, been mentioned many times in my previous papers on weather lore, especially in the last four. In this paper I have repeated but two or three small items. Cross-references have been given only to pages containing considerable material.

Thunder and lightning still remain upon my weather calendar. They, too, have been mentioned many times in other articles, but there are certain popular ideas about them upon which I have not yet touched.

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EUGENE S. MCCARTNEY

REVIEWS

Petronius, The Satiricon. Edited, with Introduction and Notes, by Evan T. Sage. New York and London: The Century Co. (1929). Pp. xl + 228.

Professor Sage's edition of Petronius is the first number I have seen of the new series, The Century College Latin Series: if other volumes reach the standard set by this, the series should command a great success. I may perhaps refer to two small defects. One is that the covers of my copy tend to bulge outwards, the other that the columns of the text strike me as too narrow in proportion to their height. In other respects the format is admirable.

The present volume opens with a well written and interesting Introduction¹. The author prefers the term "Informal Latin" to 'colloquial' or 'vulgar' Latin, but there is a certain vagueness in his term. Does it include the Sermo Cotidianus? Is the style of Encolpius in Petronius formal or informal? Mr. Sage calls it literary: I should call it colloquial. I do not see what is gained by dropping the tripartite division, represented e. g. by (a) Cicero's speeches and Livy, (b) the comedies and Cicero's letters (and the ordinary narrative of Encolpius), (c) the speech of Trimalchio's circle². The following remark by Professor Sage (xxix-xxx) is illuminating:

... It is only partly correct to speak of writers like Fronto as archaizers: they did deliberately imitate older writers like Cato, but the natural tendency of the

language was drawing them closer to Cato's standard without any imitation.

The text shows individual judgment; it is a very good text, so far as I have tested it. It is a pity there are no critical notes of any kind, as the editor has given much attention to the manuscript tradition.

I do not know why unmetrical verses are printed. For such verses see § 5, line 1 *Artis severae si quis amat effectus*, 23.3, line 1 *Huc huc convenite nunc, spatulocinaedi*, 93.2, line 2 *Et pictis avis renovata pinnis*, and 132.15, line 7 *Ipse pater veri doctus Epicurus in arte*. . . . In 79.8, line 1 *Qualis nox fuit, dii deaeque, illa* should be inserted after *fuit*. In 80.9, last line, *Vera redit facies, dissimulata perit*, *dissimulata* must be wrong. On page 68, line 1 for *Non bibit inter aquas nec poma pendentia carpit* read *Non bibit inter aquas poma aut pendentia carpit*; in 133.3, line 17 for *Circa delubrum gressum feret ebrius pubes* read *Circa delubrum gressum feret ebria pubes*; in 135.8, line 9 for *Fortuitoque luto clavus numerabat agrestes* read *Fortuitoque luto clavos numerabat agrestes*.

The notes are numerous and, in general, very sound, but in my judgment they are too brief. I will mention a few points in the notes on the Banquet, the most difficult part from the point of view of the annotator.

26.7.—*libera cena* is not Latin for a "free meal" in the modern sense. . . .

27.2.—Surely not to use the same ball twice must be a sign of luxury, not part of the game.

29.6-8.—The notes on the meaning of *pensa*, on *ipsius* (there is no reference to Greek), and *multaceam* are so short as to be without value. Those on *textorum dicta* (33.3) and *Opimianum* (34.6) seem wrong. The joke in 34.6 would be paralleled, for an Englishman, by labelling port 'Comet Port 100 years old'. In Chapter 35 I cannot believe (in spite of De Vreese³) that Petronius intended Trimalchio to show an accurate knowledge of *anything*. The notes on 37.10 *babaecalis*, 38.1 *credrae*, 38.13 *sociorum* do not satisfy me, nor do those at 41.2, 43.3, 43.4 (*involavit*), 43.7 (*quadrata*), 43.8 (*Minerva*), 44.5, 44.9. I need not enter into further details; in general I should say there are too many cases where a reference to Greek or a quotation from another author that would be illuminating is not given, and too many strange and interesting forms are passed by with a rough paraphrase, e. g. *flicem*, *cicaro*, *stelio*, *lamna*, *mufrius*, *varato*, *mantissa*, *ascia*, *cusuc*, *pharmace* (the note here is wrong).

There is no doubt whatever about the game of 64.12: *pax Palamedes* is explained in Heraeus's Index.

To my mind the best part of the book is that which contains the extremely interesting Supplementary Notes, on Petronius and the Milesian Tale (197-198), The Literary Influence of Petronius (198-199), The Satyricon and Satire (199-203), The Place and Date of the Cena (203-204), The Realism of Petronius (204-206), The Literary Theory of Petronius (206-208), The Troiae Halosis and Nero (208-210), The Book Division of the Satiricon (210), The "Short Cut"

³⁶⁷New York, Macmillan, 1925.

³⁶⁸New York and London, G. P. Putnam's Sons, 1916.

³⁶⁹Leipzig, Herman Fries, 1864.

³⁷⁰Edinburgh and London, Blackwood and Sons, 1873.

³⁷¹Edinburgh, Macniven and Wallace, no date.

³⁷²Williams and Wilkins Co. (Baltimore, 1923).

¹For the contents of the volume see the review by Dr. Hadas, THE CLASSICAL WEEKLY, 24.16. Mr. Sedgwick gives, below, the items of the Supplementary Notes. C. K.>.

²Reference may be made here to an article entitled Formal Latin and Informal Latin, by Charles L. Durham, THE CLASSICAL WEEKLY 6.97-101, and to a paper entitled A Characterization of Gallic Latin, by George D. Kellogg, THE CLASSICAL WEEKLY 6.90-94. See also the chapter entitled The Latin of the Common People, which covers pages 32-78 of Frank Frost Abbott, The Common People of Ancient Rome (New York, Charles Scribner's Sons, 1911). C. K.>.

³The reference here is to Jacques de Vreese, Petron 39 und die Astrologie, reviewed by Professor R. G. Kent, THE CLASSICAL WEEKLY 22 (1928), 119. C. K.>.



Greek and Roman Weather Lore of Winds (Continued)

Author(s): Eugene S. McCartney

Source: *The Classical Weekly*, Vol. 24, No. 3 (Oct. 20, 1930), pp. 18-24

Published by: [Classical Association of the Atlantic States](#)

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article on The Loeb Classical Library in August last, at Lexington, Kentucky, far away from my books and far away from any extensive classical library. I was none the less sure that on page xviii, under IX, Professor Foster had made a slip when he wrote the following: "Frank Frost Abbott, A History and Description of Roman Political Institutions. Boston, 1901". On my return home I found that there were two later editions, in 1907 and in 1911. The book is published by Messrs. Ginn and Company.

In THE CLASSICAL WEEKLY 18.162 I gave a specimen of Professor Foster's powers as a translator. I give here his version of 21.37⁴ (pages 107, 109, 111).

At last, when men and beasts had been worn out to no avail, they encamped upon the ridge, after having, with the utmost difficulty, cleared enough ground even for this purpose, so much snow were they obliged to dig out and remove. The soldiers were then set to work to construct a road across the cliff—their only possible way. Since they had to cut through the rock, they felled some huge trees that grew near at hand, and lopping off their branches, made an enormous pile of logs. This they set on fire, as soon as the wind blew fresh enough to make it burn, and pouring vinegar over the glowing rocks, caused them to crumble. After thus heating the crag with fire, they opened a way in it with iron tools, and relieved the steepness of the slope with zigzags of an easy gradient, so that not only the baggage animals but even the elephants could be led down. Four days were consumed at the cliff, and the animals nearly perished of starvation; for the mountain tops are all practically bare, and such grass as does grow is buried under snow. Lower down one comes to valleys and sunny slopes and rivulets, and near them woods, and places that begin to be fitter for man's habitation. There the beasts were turned out to graze, and the men, exhausted with toiling at the road, were allowed to rest. Thence they descended in three days' time into the plain, through a region now that was less forbidding, as was the character of its inhabitants.

(13) Ovid, The Art of Love, and Other Poems. By J. H. Mozley (1929). Pp. xiv + 382.

In 1928 Mr. J. H. Mozley contributed to The Loeb Classical Library a version of Statius, *Silvae*, *Thebais*, and *Achilleis*, in two volumes. Of that work something was said in THE CLASSICAL WEEKLY 22.164-165.

Mr. Mozley's volume on Ovid contains Introduction (vii-xiv); Text and Translation of the following pieces: On Painting the Face⁵ (*De Medicamine Faciei Liber*: 2-9), The Art of Love, (*Ars Amatoria*), Books I-III (12-175), The Remedies of Love⁶ (*Remedia Amoris*: 178-233), The Walnut-Tree (*Nux*: 236-249), *Ibis* (252-307), On Sea-Fishing (*Halieuticon*: 310-321), and A Poem of Consolation (*Consolatio ad Liviam*: 324-357); Appendix: On Cursing in Ancient Times (359-372); Index of Names (373-379); Index of Subjects (381-382).

In the Introduction Mr. Mozley deals with the following topics: I. The Didactic Love-Poems <of

Ovid> (vii-x), II. Miscellaneous Pieces (x-xii), The Manuscripts (xii-xiv). There is also a Note on Editions, etc. (xiv). I reproduce here, in full, the Note on Editions, etc.

The "Ars" was edited with commentary by P. Brandt, Leipzig, 1902, and the "Ibis" by Robinson Ellis, Oxford, 1881. For the numerous articles, dissertations, etc., the student is referred to Schanz, *Römische Literaturgeschichte*, vol. II, Pt. i.

Here again we have an English contributor to The Loeb Classical Library forgetting entirely the purpose of the Library. The Library was not intended primarily for 'scholars': does a scholar need a translation of Cornelius Nepos, of the *Apology* and the *Crito* of Plato, of Vergil's *Aeneid*, of Homer? The Loeb Classical Library was meant for the man who had had little or no Latin and Greek, or for the man who, though trained once as men other than 'scholars' were, in an earlier generation, in Latin or in Greek, or in both, had, in the pressure of life's occupations, lost much of the knowledge of the classical languages he once possessed. Will such a man have at his command Schanz's great (and huge) work? Would it not have been not only more scholarly but also more kindly to warn the 'general reader' that various parts of Schanz's work have appeared in different editions, and to tell him to which edition he should go, and also to tell him where and when that edition was published?

It is a pleasure—a very great pleasure—to an American to be able to say, without hesitation, that the Introductions to the volumes contributed by American scholars to The Loeb Classical Library are, many of them, far superior to the Introductions to volumes contributed by a good many of the English scholars who have had a part in the making of the Library (for one wholly admirable exception see my remarks in THE CLASSICAL WEEKLY 22.153-154 on A. W. Mair's translation of Oppian, *Colluthus*, *Tryphiodorus*. For a grievously defective volume see my remarks in THE CLASSICAL WEEKLY 22.154 on W. R. M. Lamb's volume on Plato. See also my remarks in THE CLASSICAL WEEKLY 24.2).

CHARLES KNAPP

GREEK AND ROMAN WEATHER LORE OF WINDS

(Continued from page 16)

ETESIAN WINDS

The etesian or seasonal winds are frequently mentioned in classical literature, though there is no exact agreement in regard to their periods or their duration¹⁷². There seems to have been a tendency to associate them with prevailing winds¹⁷³, but in general they were regarded as blowing from the north in summer and from the south in winter¹⁷⁴. Aristotle¹⁷⁵ says that they blew after the summer solstice and the

⁴This is the famous passage which tells of the splitting of Alpine rocks by fire and vinegar. For discussions of the passage see THE CLASSICAL WEEKLY 15.168, 16.73-76, 96, 128, 18.88, 22.98-99. Professor Foster has an excellent note on the passage (see pages 108-109).

⁵On Painting the Face is not in any sense a translation of *De Medicamine Faciei*. Better would be On Doctoring the Face; this would be at least an up-to-the minute version. So The Remedies of Love does not render *Remedia Amoris*. *Amoris* is an objective genitive; of *Love* is ambiguous.

¹⁷²See Gilbert (as cited in the text, near the beginning of this paper), 571, note 1; Arist., *Met.* 2.6. 362 a.

¹⁷³See, for example, Arist., *Met.* 2.6. 365 a; Th., *De Ventis* 2.10-12; Gellius 2.22.30; Pliny 2.124, 18.335; Lucretius 5.742; Diodorus 1.39.6.

¹⁷⁴See, for example, Tacitus, *Annales* 6.33.

¹⁷⁵*Met.*, 2.6. 362 a.

rising of the Dog-star. Seneca¹⁷⁶ tells us that they started at the time of the summer solstice and that they relieved the severity of the scorching summer months. They did not blow strongly in Italy after the rising of the Dog-star¹⁷⁷, a condition that seems at one time to have been paralleled on the island of Ceos. After the people of the island had suffered for a long time from drought and pestilence Aristaeus interceded with Zeus, who caused the etesian winds to blow for forty days after the rising of Sirius¹⁷⁸. These winds were salubrious and refreshing¹⁷⁹.

Cicero¹⁸⁰ says that the etesian winds made voyaging by sea speedy and certain¹⁸¹. They did—if one was going in their direction. In 218 B. C. Messenians implored Philip V of Macedon to come to their aid, pointing out that with the help of the winds he could easily sail from Cephallenia in one day. A secret enemy of Philip supported the proposal, knowing that, if Philip acceded, the summer would be wasted by him, since he could not sail back during the period of the winds¹⁸².

On one occasion a pilot urged Dion to seek safety upon the shore of Sicily from a menacing storm, reminding him that, if they should be blown away from the land, they would be tossed about for many days awaiting a south wind during the summer season¹⁸³.

Another example of a certain tendency of the winds to blow in one direction is to be found in the caption of a picture in the National Geographic Magazine¹⁸⁴.

Cretan windmills operate only when the wind blows from one point of the compass. But the strong breezes of the island do blow chiefly in one direction most of the time, and hence this row of windmills combs the gusts as they sweep down the valley.

The power of the etesian winds was mentioned very frequently in connection with the Nile¹⁸⁵. The ancients never tired of telling how they drove back the waters of that river.

These winds ceased at night and rose about the third hour of the day¹⁸⁶. Because of their reluctance to get up in the morning the sailors called them 'sleepy-headed' and 'dainty'¹⁸⁷. By contrast this reminds one of an old saying: "A northwest wind is a gentleman and goes to bed".

Seneca records that the whole of India and Ethiopia was watered by constant rain during the prevalence of etesian winds¹⁸⁸. In some places this period was a favorite period for drying and harvesting salt from evaporating sea water¹⁸⁹.

LOCAL WINDS

There were, of course, many local winds, *peculiares quibusque gentibus venti*¹⁹⁰, for instance the Iapygian in Calabria, the Scironian in Athens, the Cataegis in Pamphilia¹⁹¹. Horace prays that Iapyx may take Vergil safely to Greece¹⁹², for even an *albus Iapyx* may be stormy¹⁹³. This is the wind that aided Cleopatra in her flight from the battle of Actium¹⁹⁴. St. Paul¹⁹⁵ speaks of "a tempestuous wind called Euroclydon".

Our own Continent has winds with local names. The name 'chinook' is derived from the name of an Indian tribe that once lived near the mouth of the Columbia River. Members of a trading-post established by the Hudson Bay Fur Company at Astoria, Oregon, noticing that a warm southwest wind blew from over the Indian camp, called it 'chinook', a term that has been much extended¹⁹⁶. In the level coastal plain of South Carolina the sea winds which wander inland and cool the hot villages are known as 'pine-land breezes' because they whisper through the tops of the long-leaf pines¹⁹⁷.

THE SUN AND THE PERIODS OF CERTAIN WINDS

We have seen that the directions of the principal winds were referred to various positions of the sun. The periods of certain winds were likewise associated with this body¹⁹⁸.

Thus Caecias and in general the winds north of the summer solstice blow about the time of the spring equinox, but after the autumn equinox Lips; and Zephyrus about the summer solstice, but about the winter solstice Eurus.

The etesian winds started to blow after the summer solstice¹⁹⁹. The periods of other winds too might be dated with reference to the solstices and the equinoxes²⁰⁰.

Recently a Michigan seeress gave me the following directions: "Watch which way the wind is when the sun crosses the line. That will be the prevailing direction for the season". Another friend informs me that, if the wind is prevailing in the West or in the Southwest on March 21, one may look for an early spring, but, if the wind is in the Northwest at that time, one should look for a backward spring, because the wind will be in that direction for most of the time for three months.

In a previous paper I listed a number of other weather associations of the wind and the sun²⁰¹.

THE WEATHER-VANE

The close association between wind and weather in general is shown by our giving to the device which shows the direction of the wind the name weather-vane rather than wind-vane. The contrivance shows

¹⁷⁶5.10.1-2. ¹⁷⁷Seneca 5.10.2.
¹⁷⁸Diodorus 4.82.1-3; Apollonius Rhodius 2.516-527; Clemens Alexandrinus, Stromata 6.28.4-6; Callimachus, Aitia 3.1 (page 209 of A. W. Mair's translation, in The Loeb Classical Library); Nonnus 5.269-279. See also Geoponica 1.9.7.

¹⁷⁹Cicero, De Natura Deorum 2.131. Compare Geoponica 1.12.15, 31, 36.

¹⁸⁰Cicero, De Natura Deorum 2.131.

¹⁸¹Compare Seneca, Thyestes 126-129 nives quas... aestas veliferis solvit Etesias. See also Aratus, Phaenomena 151-156.

¹⁸²Polybius 5.5.3-7. ¹⁸³Plutarch, Dion 25.1-2. See also 23.3.155.207 (February, 1929). I confess that the caption taxes my credulity.

¹⁸⁴Herodotus 2.20; Athenaeus 2.87; Pomponius Mela 1.53; Diodorus 1.38.2; Seneca 4.2.21-23; Pliny 5.55; Lucretius 6.712-718; Ammianus Marcellinus 22.15.5, 7. Not less interesting is Tacitus, Annales 6.33.

¹⁸⁵Pliny 2.127. See also Arist., Met. 2.6, 362 a.

¹⁸⁶Seneca 5.11.

¹⁸⁷5.18.2. According to Arrian 6.25 the country of Gedrosia was likewise supplied with rain by periodical winds.

¹⁸⁸Strabo 13.1.48, at the end.

¹⁹⁰Pliny 2.120. See also Seneca 5.17.4; Th., De Ventis 10.62; Procopius 8.4.10; Isidore 37.5. The most important source for references to local winds is Ventorum Situs et Appellationes, which is based upon a work of Aristotle.

¹⁹¹Seneca 5.17.4; Vitruvius 1.6.10. ¹⁹²Carmina 1.3.4.

¹⁹³Horace, Carmina 3.27.20. ¹⁹⁴Gellius 2.22.23.

¹⁹⁵Acts 27.14.

¹⁹⁶A. T. Burrows, The Chinook Winds, The Journal of Geography 2 (1903), 124-136.

¹⁹⁷The Atlantic Monthly 144 (1929), 349.

¹⁹⁸Arist., Met. 2.6, 364 b. (E. W. Webster's translation).

¹⁹⁹Ibidem, 362 a. ²⁰⁰See THE CLASSICAL WEEKLY 22.26.

²⁰¹THE CLASSICAL WEEKLY 22.29. Zeno, as quoted by Diogenes Laertius, Book 7, Chapter 1, Section 81. 152, says that the sun produces winds by turning the clouds into vapor.

more than the direction of the wind. It indicates also the kind of weather to follow, since in popular weather lore the wind is the pulse of the weather.

So far as I am aware, the earliest weather-vane of which we have any record played 'I spy' with the wind upon the beautiful octagonal Tower of the Winds which was erected in Athens, in the first century before Christ, by Andronicus of Cyrrhus. It consisted of a triton holding a rod in his right hand and working on a pivot in such a way that the rod always pointed at the figure which typified the prevailing wind²⁰². With the help of the eight bas-reliefs below even a casual visitor in Athens might be able to identify the wind.

In far later times the cock adorned weather-vanes on Church spires. The reason for its selection, according to a medieval Latin poem, is that it was *mirabilis Dei creatura*, with many wholesome lessons to teach to the followers of Christ²⁰³.

Makeshift ways of telling from which direction the wind is coming are much more interesting than the use of the weather-vane. A peculiar method practised by seafaring men is thus described by Miss Pearl Wilson in THE CLASSICAL WEEKLY 10.24:

...If you hold your head so that the wind comes straight into one ear, and then turn it slowly till it is blowing with equal force in both ears, you will find yourself then facing it directly.

Attention has been called²⁰⁴ to this method in connection with Vergil, Aeneid 3.513-514:

haud segnis strato surgit Palinurus et omnis
explorat ventos atque auribus aera captat.

In THE CLASSICAL WEEKLY 13.219 I quoted a striking confirmatory passage from Kipling, Captains Courageous²⁰⁵:

He <Dan, the captain's son> could steer in anything short of half a gale from the feel of the wind on his face, humoring the We're Here just when she needed it²⁰⁶.

In Joseph Conrad's short story, The Inn of the Two Witches^{206a}, the following statement is made of a seaman who had an adventure on land during a storm: "...he steered his course by the feel of the wind".

A method not entirely unlike that of sailors of old is attributed to one of the characters in The Story of Kennett, by Bayard Taylor²⁰⁷:

Once, indeed, she stopped, wet her forefinger with her tongue, and held it pointed in the air. There was very little breeze, but this natural weathercock revealed from what direction it came.

"Southwest!" she said, nodding her head—"lucky!"

An odd practice is that of tasting the wind to prophesy the direction of a coming wind. It is resorted to by a negro in Du Bose Heywood, Porgy²⁰⁸:

²⁰²Vitruvius 1.6.4.

²⁰³Stephen Gaselee, The Oxford Book of Medieval Latin Verse, 178-180 (Oxford: At the Clarendon Press, 1928).

²⁰⁴Hermes 42.44-45.

²⁰⁵Page 154 of the edition published by The Century Company for The Review of Reviews Company. <Pertinent is a note on Aeneid 3.514, by Dr. B. W. Mitchell, THE CLASSICAL WEEKLY 7 (1914), 168. C. K.>.

²⁰⁶Compare a humorous sentence of O. Henry, in The Passing of Black Eagle, one of the stories in Roads of Destiny: "They want them whiskers and that nose of his to split the wind at the head of the column".

^{206a}The story is to be found in a volume entitled Within the Tides: Tales, 210 (New York, Doubleday, Page, and Co., 1916).

²⁰⁷Page 2 (New York, Putnam, 1867).

²⁰⁸Page 137 (New York, George H. Doran Co., 1925).

Standing in the bow, he moistened his finger, and held it up to the wind. "You mens bes' git all de fish yuh kin tuhday", he admonished. "Win' be in de eas' by tuhmorruh. It gots dot wet tas' ter um now."

THE FARMER AND THE WINDS

Perhaps no classes of persons were more keenly interested in the winds and their directions than farmers and sailors²⁰⁹. The farmer gave heed to the wind in relation not only to the immediate activities of the day, but also to the general management of the farm throughout the year. For the benefit of the farmer Columella tells the kinds of weather to be expected at the rising and the setting of many stars throughout the year. It is but seldom that he fails to mention wind²¹⁰.

The north wind was so severe that the pruner had to guard against exposing to it the incisions he made, and orchards and vineyards in general were not to face it, except in Africa (i. e. the province), Cyrene, and Egypt²¹¹. Trees were not to be dug up for transplanting with the wind blowing from the north or from any direction between it and the point of rising of the sun at the winter solstice; at any rate the roots were not to be exposed to these winds, since they killed the trees, and farmers did not always know why. Cato thought that rains and all winds should be avoided in transplanting²¹².

Trees and vines were to be planted so that they would be exposed to Aquilo²¹³. Democritus thought that this produced more fragrant fruit²¹⁴. There was a belief that this exposure caused trees to thrive and sprout and that the cold in season made them more compact and harder²¹⁵. In vineyards, however, stakes were so arranged as to break the force of Aquilo and to shield the vines from cold²¹⁶.

When Aquilo prevailed, no plowing, planting, or sowing was to be done. The cold would injure sprouting seed and would even freeze the roots of trees that were being transplanted. Praedoctus esto: alia robustis prosunt, alia infantibus²¹⁷. Cato advised that in the operation of transplanting trees the bark should be marked so that the tree could be reset in the same direction; otherwise the northern part would be scorched by southern suns and the southern part frozen by Aquilo²¹⁸.

Whoever felt the cold of Aquilo was to beware. It was more dangerous than the north wind. In Asia, Greece, Spain, coastal Italy, Campania, and Apulia, however, orchards and vineyards were to face it²¹⁹. In Italy beehives were to face neither Aquilo nor Favonius, but the East²²⁰.

There was a widespread belief that male cattle were conceived when the parents were facing Aquilo²²¹.

²⁰⁹See amusing passages in Lucian, Icaromenippus 25-26.

²¹⁰He mentions wind in 11. 2, 4, 14, 15, 20, 21, 22, 24, 31, 34, 36, 37, 39, 40, 43, 45, 49, 51, 52, 58, 63, 65, 66, 74, 77, 78, 84, 88, 89, 93, 94, 97. ²¹¹Pliny 18.328. ²¹²Pliny 17.85-86. ²¹³Pliny 18.334.

²¹⁴Pliny 17.23.

²¹⁵Pliny 17.10. See also Th., Historia Plantarum 4.1.4, 5.1.11.

²¹⁶Columella 4.16.3. See also Pliny 17.10.

²¹⁷Pliny 18.334. ²¹⁸Pliny 17.83. ²¹⁹Pliny 18.335-336.

²²⁰Pliny 21.80. See also Geoponica 15.2.1.

²²¹Pliny 8.189, 18.336; Geoponica 17.3.6; Columella 7.3.12; Palladius, July, 4.4; Aristotle, De Animalibus Historia 6.19. De Generatione Animalium 4.2.

In healthful regions villas and vineyards were to face Subsolanus²²². The Geoponica²²³ advises having the house face the rising sun, because Notus was damp and capricious and unwholesome. Pliny²²⁴ records the same advice for villas in temperate regions, but says that in hot places they should face the north, in cold places the south.

It was recommended that apiaries and vineyards of Italy and Gaul should face Voltumnus²²⁵.

Those who were planting olives were to be on their guard against Notus for four days at the rising of the Vergiliae. While it was blowing the farmer was not to fell timber or to handle wine, since for Italy this wind meant either moisture or much heat. Palms might face this wind, but not the pruned parts of trees or vines. The man who did grafting was fearful of its effect on twigs and buds²²⁶. Grafting of olive trees and fig trees was not to be done with a south wind blowing²²⁷. Pruning of vines and trees should be done with dry winds blowing²²⁸.

Budding trees and those in bloom were injured by a hot wind and by a cold wind²²⁹. Under the spell of Auster fruit matured more quickly, but not so well²³⁰. Both vines and trees thrived better when they were facing Aquilo²³¹.

Dolia were not to be opened except on a clear day, with Auster blowing and the moon full²³². Some wine-tasters tasted wine with the north wind blowing because then the wine was clear and undisturbed, but experts thought that better proof of the quality of wine was to be had under the trying conditions provided by Auster²³³. A writer who visited Sicily half a century ago says that "wine cannot be fined" during the days when the sirocco is blowing²³⁴.

As the north wind caused the conception of male cattle, so the south wind insured the birth of females²³⁵. Africus, too, influenced the conception of females²³⁶.

It was recommended that granaries should face either Septentrio or Aquilo, since it was believed that winds from other directions generated insects destructive to grain²³⁷. It was supposed that book worms owed their origin to south winds. For this reason Vitruvius²³⁸ was opposed to having the library of a house face this direction.

Pliny informs us that animals mated and began to conceive when Favonius started to blow. This wind he calls *genitalis spiritus mundi*. An even more vivid expression of the same idea is the peasants' name for it, *catlithio*²³⁹. In this connection it is pertinent to quote from a description of an old Scotch custom²⁴⁰:

²²²Pliny 18.337. ²²³2.3.6. ²²⁴18.33. ²²⁵Pliny 18.338. ²²⁶Pliny 18.329. On handling wine see also Cato 31.2. ²²⁷Pliny 17.112; Cato 40.1. ²²⁸Pliny 15.62. ²²⁹Th., De Causis Plantarum 4.14.1. ²³⁰Pliny 17.11. ²³¹Pliny 17.23. ²³²Pliny 14.135. ²³³Geoponica 7.7.1. ²³⁴Smyth (as cited in note 53), page 5. ²³⁵Pliny 8.189, 18.330; Columella 7.3.12; Geoponica 17.3.6; Aristotile, as cited in note 221. ²³⁶Pliny 18.336. ²³⁷Vitruvius 6.6.4. <See also THE CLASSICAL WEEKLY 23.49, column 2. C. K.> ²³⁸6.4.1. Aelian says (De Natura Animalium 17.40) that a heavy atmosphere brings *τετραγυαβα* into being.

²³⁹Pliny 16.93-94. In the Transactions and Proceedings of the American Philological Association 51.110 I devoted over half a page to the belief in the fecundating powers of the winds.

²⁴⁰W. Carew Hazlitt, Faiths and Folklore. A Dictionary of National Beliefs, Superstitions and Popular Customs, Past and Present, with Their Classical and Foreign Analogues, Described and Illustrated, 638 (London, Reeves and Turner, 1905).

The first night of the new year, when the wind blows from the west, they call *dàr-na coille*, the night of the fecundation of the trees; and from this circumstance has been derived the name of that night in the Gaelic language.

Cato advised that olive trees should face Favonius²⁴¹. Since Favonius softened the ground, it indicated the time to prune vines, tend to fruits, plant trees, and give attention to olive trees. By its breezes this wind nursed things along²⁴². Unless the berries of olive trees were plucked before Favonius came, they acquired new strength and clung to the trees²⁴³.

In Provincia Narbonensis and in Liguria and part of Etruria it was considered folly to sow in the face of Circius, but far-sighted to receive it from one side²⁴⁴.

LOCAL WINDS AND WARFARE

A knowledge of the peculiarities of local winds was a great military asset and sometimes meant the difference between victory and defeat²⁴⁵. I shall give two examples of this by land and two by sea.

A good illustration of the deliberate, rather than the fortuitous, use of the wind is to be found in the career of Camillus. Latins and Volscians, caught between two Roman forces, barricaded their encampment with a formidable wooden palisade. The Romans had to act before a relieving force should come. Noticing that a strong wind blew down from the mountains regularly at sunrise²⁴⁶, Camillus planned a daybreak attack with two contingents, one armed with weapons, the other with fire. The fire was directed at the point where the wind struck the defences with greatest speed. The fiery darts found lodgment in the crowded timbers of the palisade and flames soon spread in every direction and finally reached the camp. Few of the Latins made their escape²⁴⁷.

Beyond the river Tagonius in Spain amid the caves and hollows of a cliff that faced the north dwelt the Characitani, a tribe that felt boastfully secure in the fastnesses of its retreat. Sertorius, encamping at the base of the cliff, found it unassailable, but he noticed that great quantities of dust were being carried against the openings from the porous and crumbly soil below. Learning the local characteristics of the wind, he had his men collect loose earth, which the barbarians regarded as a mound for a futile assault upon them. The next day, however, a breeze sprang up which grew stronger and stronger and carried up more and more dust. Horses were driven back and forth through it in order to pulverize it still more. Since all the caves faced the wind, the barbarians were soon being blinded and choked. They held out with difficulty for two days, but surrendered on the third. The peculiar nature of this feat added greatly to the prestige of Sertorius²⁴⁸.

²⁴¹Pliny 15.21, 18.337; Cato 6.2; Varro, De Re Rustica 1.24.1. ²⁴²Pliny 18.337. ²⁴³Pliny 15.12. ²⁴⁴Pliny 17.21.

²⁴⁵I am planning to discuss in a general volume on ancient warfare the effect of the weather on military operations both by land and by sea. I touched upon the subject in THE CLASSICAL WEEKLY 23.4.

²⁴⁶On the association of the wind with sunrise see Arist., Met. 2.5, 361 b, Prob. 26.34; Th., De Ventis 3.16-18; Pliny 2.129. For mention of this association in connection with military operations see Livy 25.27.6, 29.27.8; Lucan 5.717-718. <See also note 85, above. C. K.> ²⁴⁷Plutarch, Camillus 34.4-5. ²⁴⁸Plutarch, Sertorius 17.3-7.

A good example of the effect of the local vagaries of wind upon naval warfare is afforded by the Battle of Salamis²⁴⁹:

Themistocles is thought to have divined the best time for fighting with no less success than the best place, inasmuch as he took care not to send his triremes bow on against the Barbarian vessels until the hour of the day had come which always brought the breeze fresh from the sea and a swell rolling through the strait. This breeze brought no harm to the Hellenic ships, since they lay low in the water and were rather small; but for the Barbarian ships, with their towering sterns and lofty decks and sluggish movements in getting under way, it was fatal, since it smote them and slewed them round broadside to the Greeks, who set upon them sharply. . .

During the Peloponnesian War twenty Athenian vessels under Phormio attacked forty-seven vessels of the Corinthians and their allies in the Corinthian Gulf. Even this numerical superiority did not give the enemy confidence, for they formed in a circle with the prows outward. The Athenians sailed round and round them, keeping them ever alert for an attack. But Phormio had given orders not to charge; he was hoping that the enemy would not be able to keep their ships in order and also that a breeze which usually blew from the gulf toward dawn would spring up and complete the confusion. When the wind observed its daily schedule, the Athenians made the long-delayed attack. They sank some ships and captured twelve others as they were fleeing²⁵⁰.

HARBINGERS OF WIND

There were many ways of judging what kind of wind was going to blow. Pindar has a sentence with a proverbial ring, to the effect that the wise man knew what the third day's wind was going to be²⁵¹. The air as it condensed gave indications by its thickness or thinness or by its cold or heat and by other characteristics also²⁵², but the winds themselves were good indexes.

When winds, instead of being dispersed by other winds, died down of their own accord, they changed to the next wind to the right, going around the compass-chart sunwise²⁵³. If the wind that happened to be blowing was felt to be hot, one might conclude that it would last for several days²⁵⁴.

Seneca²⁵⁵ mentions breezes which rose before day-break, but fell when the sun became strong. They started in the spring and ceased by the end of summer.

If periodic winds have been blowing for a long time, and a windy autumn follows, the winter is windless: if however the contrary happens, the character of winter is also reversed²⁵⁶.

The earth, too, was a prophet, for, as Pliny²⁵⁷ tells us, it proclaimed a north wind when it was becoming dry, but a south wind when it was becoming moist with

dew. Theophrastus²⁵⁸, however, simply says that during a northerly wind everything dries up, but during a south wind there is abundant moisture.

It is said that breezes do not blow from a river in a hot country. The Nile, the source and mouth of which are in hot lands, is given as an example of this²⁵⁹. It seems that rivers had a reputation for not stirring up breezes in the morning, for we are told that Hannibal planned the Battle of Cannae in a way to take advantage of local conditions when he learned that the Volturnus caused strong winds to blow in the morning²⁶⁰.

When rain comes, wind ceases, but wind generally follows rain in those places where the rain falls²⁶¹. A south wind generally blows after snow and a north wind after hoar-frost²⁶².

Aristotle was much interested in the connection between shooting stars and wind²⁶³. Signs from them and from comets are given in THE CLASSICAL WEEKLY 20.46²⁶⁴, 23.12.

If the sky is overcast, wind comes from the quarter in which the sun is first seen²⁶⁵, or, as Pliny²⁶⁶ puts it, in which the scattering of the clouds has revealed the sky. Other relations of clouds and winds are noted in THE CLASSICAL WEEKLY 23.3.

Thunder and lightning, too, were studied as indexes of the winds that were to be expected. The signs derived from them are thus summarized by Theophrastus:

If lightning comes from all sides, it indicates rain, and from any quarter from which the flashes come in quick succession there will be wind. In summer from whatever quarter lightning and thunder come, there will be violent winds²⁶⁷; if the flashes are brilliant and startling, the wind will come sooner and be more violent; if they are of gentler character and come at longer intervals, the wind will get up gradually. In winter and autumn however the reverse happens, for the lightning causes the wind to cease; and, the more violent the lightning and thunder are, the more will the wind be reduced. In spring I consider that the indications would not so invariably have the same meaning,—and this is also true of winter.

If, while a south wind is blowing, there comes lightning from the north, the wind ceases. If there is lightning at dawn, the wind generally ceases on the third day: other winds than a south wind however do not cease till the fifth seventh or ninth day, though a wind which got up in the afternoon will cease sooner²⁶⁸.

Thunder in winter at dawn indicates wind²⁶⁹ rather than rain; thunder in summer at midday or in the evening is a sign of rain. If lightning is seen from all sides, it will be a sign of rain or wind²⁷⁰, and also if it occurs in the evening. Again, if when the south wind²⁷¹

²⁴⁹De Signis 30. Compare Th., De Ventis 10.58.

²⁵⁰Th., De Ventis 4.25 seems to say in one breath that the Nile is the sole example of this and in the next to make a generalization that includes rivers in Libya, Babylonia, and Sousa. See also Th., De Ventis 6.46; Ammianus Marcellinus 22.15.13.

²⁵¹Frontinus, Strategemata 2.2.7. <See note 85, above. C.K.>.

²⁵²Arist., Met. 2.4, 360 b, 361 b. Compare Th., De Ventis 8.50.

²⁵³Th., De Signis 34. Compare Arist., Prob. 26.3.

²⁵⁴Prob. 26.23. See also Th., De Ventis 6.36.

²⁵⁵See also Lydus, De Ostentis 4. ²⁵⁶Th., De Signis 31.

²⁵⁷2.120.

²⁵⁸See also Aratus, Phaenomena 924-925; Geoponica 1.3.3, 1.11.8.

²⁵⁹Th., De Signis 32-33 (A. Hort's translation, in The Loeb Classical Library). See also Pliny 18.354.

²⁶⁰See also Pliny 18.354.

²⁶¹See also Aratus, Phaenomena 933-937; Vergil, Georgics 1.

²⁶²370-373, and Servius there, on 370; Geoponica 1.3.3.

²⁶³Compare Arist., Prob. 26.20. See also an interesting note in R. C. Jebb's edition of the Ajax of Sophocles, Appendix, 223-224 (Cambridge, at the University Press, 1896).

²⁴⁹Plutarch, Themistocles 14.2 (B. Perrin's translation, in The Loeb Classical Library).

²⁵⁰Thucydides 2.83-84. For other examples of familiarity with local conditions see Plutarch, Marius 37.3; Procopius 8.4.10. Polybius 4.44 is interesting in contrasting the aid afforded by the winds to those sailing to and from Brundisium with the difficulties it presented to those sailing to and from Chalcedon.

²⁵¹Nemea 7.17. Compare Vegetius 4.41 Aer vero et mare ipsum nubiumque magnitudo vel species sollicitos instruit nautas.

²⁵²Th., De Ventis 6.35.

²⁵³Th., De Signis 35. <For "sunwise" see above, note 23a.

C. K.>. ²⁵⁴Pliny 18.339. ²⁵⁵5.7. ²⁵⁶Th. De Signis 34. ²⁵⁷18.339.

is blowing at early dawn, there is lightning from the same quarter, it indicates rain or wind. When the west wind is accompanied by lightning from the north, it indicates either storm or rain. Lightning in the evening in summer time indicates rain within three days, if not immediately. Lightning from the north in late summer is a sign of rain²⁷².

Signs of wind are swelling seas, moaning billows, far-resounding beaches, murmuring crags and promontories, and echoing woods²⁷³. An explanation of the sounds that herald a south wind is given by Aristotle²⁷⁴:

When a south wind is going to blow there is a premonitory indication: a sound is heard in the places from which the eruptions²⁷⁵ issue. This is because the sea is being pushed on from a distance and its advance thrusts back into the earth the wind that was issuing from it. The reason why there is a noise and no earthquake is that the underground spaces are so extensive in proportion to the quantity of the air that is being driven on that the wind slips into the void beyond.

Modern descriptions of the sounds that precede storms from the seas are not less picturesque than ancient accounts. Washington Irving gives a vivid account of a rising storm encountered by Columbus²⁷⁶ in the *New World*:

One of those tremendous hurricanes which sometimes sweep those latitudes had gradually gathered up. The baleful appearance of the heavens, the wild look of the ocean, the rising murmur of the winds, all gave notice of its approach.

A passage in Thoreau²⁷⁷ is so illuminating that it deserves quotation in full:

...a sudden loud sound from the sea, as if a large steamer were letting off steam by the shore... The old man said that this was what they called the "rut," a peculiar roar of the sea before the wind changes, which, however, he could not account for. He thought that he could tell all about the weather from the sounds which the sea made.

Old Josselyn, who came to New England in 1638, has it among his weather-signs that "the resounding of the sea from the shore, and murmuring of the winds in the woods, without apparent wind²⁷⁸, sheweth wind to follow."

Being on another part of the coast one night since this, I heard the roar of the surf a mile distant, and the inhabitants said it was a sign that the wind would work round east, and we should have rainy weather. The ocean was heaped up somewhere at the eastward, and this roar was occasioned by its effort to preserve its equilibrium, the wave reaching the shore before the wind. Also the captain of a packet between this country and England told me that he sometimes met with a wave on the Atlantic coming against the wind, perhaps in a calm sea, which indicated that at a distance the wind was coming from an opposite quarter, but the undulation had traveled faster than it.

²⁷²The passage quoted in the text is to be found in Th., *De Signis* 21 (A. Hort's translation).

²⁷³Aratus, *Phaenomena* 909-912; Th., *De Signis* 20; *Geoponica* 1.11.7; Vergil, *Georgics* 1.356-359, *Aeneid* 10.98-99 and Servius on 98; Lucretius 2.764-767; Cicero, *De Divinatione* 1.13; Pliny 18.359-360; Seneca, *Agamemnon* 487-489. Almost all these passages are quoted in full by A. S. Pease, *M. Tulli Ciceronis De Divinatione*, VI, pages 79-80 (University of Illinois Studies in Language and Literature, VI, VIII). Lucan 5.571-572 makes the boatman Amyclas say to Caesar as they prepare to cross the Adriatic Sea: *si murmur ponti consulimus, Cauri verrunt mare*.

²⁷⁴Arist., *Met.* 2.8, 367 a (E. W. Webster's translation).

²⁷⁵I, e. from winds that move beneath the surface of the earth.

²⁷⁶Columbus, Book XV, Chapter I.

²⁷⁷The *Wellfleet Oysterman*, Cape Cod, 114-116 (Riverside edition).

²⁷⁸Compare Aratus, *Phaenomena* 911.

A far different, but no less picturesque, vocabulary is used by Du Bose Heyward²⁷⁹ to describe the noises of the storm-bringing wind:

At one o'clock the tension snapped. As though it had been awaiting St. Christopher's chimes to announce "Zero Hour," the wind swung into the east, and its voice dropped an octave, and changed its quality. Instead of the complaining whine, a grave, sustained note came in from the Atlantic, with an undertone of alarming variations, that sounded oddly out of place as it traversed the inert waters of the bay.

Slowly the threatening undertone of the wind grew louder. Then, as though a curtain had been lowered across the harbor mouth, everything beyond was blotted out by a milky screen.

A picturesque name for a sound made by the sea is 'calling of the sea':

A murmuring or roaring noise, sometimes heard several miles inland during a calm, in the direction from which the wind is about to spring up, and is known as the calling of the sea²⁸⁰.

... If at sea during a wind there is a sudden calm, it indicates a change or an increase of wind. If promontories seem to stand high out of the sea²⁸¹, or a single island looks like several, it indicates a change to south wind. If the land looks black from the sea, it indicates a north wind, if white, a south wind²⁸².

... The ebb-tide indicates a north wind, the flowing tide a wind from the south. For, if the flowing sets from the north, there is a change to the south, and if an ebb-tide comes from the south, there is a change to the north²⁸³.

Waves rising higher than usual signified the advent of winds²⁸⁴.

Interesting signs of wind are provided by living things. If a pilot sees cranes turn and fly in the opposite direction, he knows that wind is threatening from the quarter toward which they had been going²⁸⁵. Winds come from the direction in which dolphins appear²⁸⁶. It is still believed by seamen in the Aegean that dolphins show the direction of the next wind or of the wind on the following day²⁸⁷. Many similar signs of wind derived by the ancients from the actions and the habits of animals both by sea and by land are listed in THE CLASSICAL WEEKLY 14.97-98.

Modern illustrations of signs of wind given by animal life are not hard to find. There is a Louisiana belief²⁸⁸ that

Roosters resting on a tree limb always roost with their heads pointing in the direction in which the wind will blow the next morning.

²⁷⁹Porgy, 142-143 (New York, George H. Doran Company, 1925).

²⁸⁰Richard Inwards, *Weather Lore: A Collection of Proverbs, Sayings, and Rules Concerning the Weather*, 127 (London, Elliot Stock, 1898). The quotation is exact.

²⁸¹Compare Arist., *Met.* 3.4, 373 b, *Prob.* 26.53. In reporting the successful crossing of the English Channel by a swimmer starting from France a newspaper dispatch said: "At 8 o'clock the wind had freshened and we could plainly see the sands of South Forland on the English side, which was a bad sign, as such conditions usually presage a high wind."

²⁸²The passage "If at sea... a south wind" is to be found in Th., *De Signis* 31 (A. Hort's translation, in The Loeb Classical Library).

²⁸³*Ibidem*, 29 (A. Hort's translation).

²⁸⁴Th., *De Signis* 6.35; Pliny 18.359.

²⁸⁵Aelian, *De Natura Animalium* 3.14. Compare 7.7.

²⁸⁶Alciphron 1.10; Artemidorus 1.16 (page 110 of R. Hercher's edition, Leipzig, Teubner, 1864); Pliny 18.361; Bede 36. See also THE CLASSICAL WEEKLY 14.98.

²⁸⁷Erhard, *Fauna der Cykladen*, 1.27 (Leipzig, Voigt und Gunther, 1858).

²⁸⁸*Journal of American Folk-Lore* 40 (1927), 200, No. 1385. See also 201, No. 1397.

I quote the following paragraph from a newspaper article²⁸⁹:

Just before a hurricane there invariably arrive off the Caribbean coasts vast numbers of these weather-wise birds that are called in Dominica 'Twa-oo,' from their peculiar cry. These birds are regarded locally as sure harbingers of the dreaded tropical storms. They only appear during the calms immediately before the wind and rain break loose in all their fury. They cover the rocks in large flocks, coming in from the desolate sandy islands where they breed. American bird books call them the 'sooty tern,' but they are known to the natives as 'hurricane birds.'

A most remarkable tale, interesting either as fact or as fiction, is told of the Seminoles of Florida²⁹⁰:

Four weeks before the hurricane struck Palm Beach and the east coast of Florida last September <1928>, the Seminole Indians of the Okeechobee Band prophesied the disaster. They vividly described the velocity of the coming wind, specified the depth of water which would sweep the Everglades, and warned of general destruction and appalling loss of life.

No quibbling marked their predictions. The blossoming of the saw grass first attracted their attention. This blossoming was out of season, and untimely blooming of this Everglades grass has been for centuries a signal to the Seminoles to stop, look, and listen.

They sensed a certain tenseness in the stillness which hung over the 'glades; the smaller birds stopped singing and chirped nervously, and their flights were short and furtive—their general drift was northward and westward. The great buzzards, too, were apprehensive and seemed to group themselves as though in consultation. Instead of taking their usual great, gliding flights, they went aloft and nervously beat the air—their drift was northward and westward. The alligators barked with unusual frequency and exposed themselves recklessly, moving in great numbers toward deeper waters. The water snakes moved with them. Meadow rats and rabbits began a trek along the roads and trails, northward and westward, squeaking and grunting irritably, making little effort to hide their movement. Crickets signaled a warning to those who

would listen. This was enough. The Seminoles had read the 'signs'.

Having read the 'signs', the Seminoles prepared a brief migration into the land of their brothers, the Tallahasseees, far to the north and west of their own threatened territory. Before leaving they urged their white friends to follow them to safety. . . . Insofar as is known, not a single Seminole was lost in the storm.

A friend of mine who crossed the Everglades in the middle of the summer of 1929 heard that the Seminoles had warned the white people of impending storm because of the blooming of a plant out of season and because of the restlessness of alligators. In the early fall there were storms to the south of Florida, but most of their fury was spent before they reached Florida.

Theophrastus lists still other miscellaneous signs:

Again²⁹¹, if the wind is from the south, the snuff of the lamp-wick indicates rain; it also indicates wind in proportion to its bulk and size: while if the snuff is small, like millet-seed, and of bright colour, it indicates rain as well as wind. Again, when in winter the lamp rejects the flame but catches, as it were, here and there in spurts²⁹², it is a sign of rain: so also is it, if the rays of light leap up on the lamp, or if there are sparks.

Some say²⁹³ that, if in the embers there is an appearance as of shining hail-stones, it generally prognosticates hail²⁹⁴; while, if the appearance is like a number of small shining millet-seeds, it portends fair weather, if there is wind at the time, but, if there is no wind, rain or wind.

One recalls in this connection that Aeolus foretold the rising winds by observing fire²⁹⁵.

The cracking sounds made by glued articles when the south wind was blowing indicated a change to the north wind²⁹⁶.

(To be concluded)

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²⁸⁹The Detroit News, Sunday, June 9, 1929, Feature-Fiction Section, page 14.

²⁹⁰Clarence E. Bosworth, Red Signs and White Science: How the Seminoles Read the Signs of Nature and Escaped the Recent Tropical Hurricane, American Forests and Forest Life 35 (1929), 85-88. The passages quoted in the text appear on pages 85-86.

²⁹¹For this passage see Th., De Signis 14 (A. Hort's translation).

²⁹²Compare Vergil, Georgics 1.392; Pliny 18.358.

²⁹³Th., De Signis 25 (A. Hort's translation).

²⁹⁴Aratus, Phaenomena 1041-1043.

²⁹⁵Diodorus Siculus 5.7.7. See also THE CLASSICAL WEEKLY 18.156, 23.6. Interesting, too, is Pliny 18.358.

²⁹⁶Arist., Prob. 1.24. Compare Th., De Signis 30.



Greek and Roman Weather Lore of Winds (Concluded)

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Source: *The Classical Weekly*, Vol. 24, No. 4 (Oct. 27, 1930), pp. 25-29

Published by: [Classical Association of the Atlantic States](#)

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The Classical Weekly

VOL. XXIV, No. 4

MONDAY, OCTOBER 27, 1930

WHOLE No. 641

GREEK AND ROMAN WEATHER LORE OF WINDS

(Concluded from page 24)

ASTROLOGY AND ASTRO-METEOROLOGY

It is a cardinal principle of ancient superstition that changes in the phases or conditions of heavenly bodies bring changes upon earth, among which are included the vagaries of the weather. The Chaldeans held that planets by their rising and setting and sometimes by their colors foreshadowed, among other things, great winds (hurricanes?), tempestuous rains, and droughts²⁹⁷. At the beginning of every year Indian philosophers predicted droughts, winds, and rain²⁹⁸, though we are not told that heavenly bodies were observed by them. Among the Romans the planet Mars had a reputation for abounding in winds and fitful flashes of lightning²⁹⁹. Plutarch tells how the quenching of heavenly bodies that looked like fire caused unusually violent winds³⁰⁰.

There is extant a systematic prediction of the kinds of weather that will ensue when Jupiter is in each 'house' of the zodiac³⁰¹. I give as a sample the influence of Jupiter in Gemini in the 'house' of Hermes. The prevailing winds will be Notus and Liba. The winter will begin windy, change to temperate in the middle, and become frosty and windy at the end. The spring will be mild, with light rains. The summer will be temperate on account of the brisk blowing of the etesian winds for a long time. In the fall there will be damaging hail³⁰².

With the confidence and assurance of a modern almanac Eudoxius (Eudoxus?) made a twelve-year weather calendar in which he predicted, sometimes for the entire year, the general type of weather that one was to expect. He based his forecasts upon the presence of the moon in the various signs of the zodiac on the fourteenth of June and the twentieth of July³⁰³. If, for instance, the moon be found in Gemini on the twentieth of July, Lips will dominate the year, though other winds will mingle with it. The winter will start damp and windy, change to temperate in the middle, and end frosty and windy. During the next summer etesian winds will blow³⁰⁴.

Among the changes of weather that are listed in various star-catalogues as attending the rising and the setting of stars the wind receives much prominence³⁰⁵.

A great deal of this material is conveniently collected and arranged in composite star-calendars in Daremberg et Saglio, *Dictionnaire des Antiquités Grecques et Romaines* (s. v. *Calendarium*, Volume I, Part 2, 836-849). An important reference for this section of my paper is Julius Röhr, *Beiträge zur Antiken Astro-meteorologie*, *Philologus* 83 (1928), 259-305.

THE HUMAN BAROMETER

Winds may bring pleasure and prosperity or they may cause discomfort and even adversity. The ideal living conditions supposed to exist in the Islands of the Blest off the coast of Spain were attributed in no small measure to beneficent winds laden with dew³⁰⁶. One may compare with this the salutary effects produced by a wind in the western part of North America, the chinook, which has been described³⁰⁷ as "an ever-welcome guest, whose coming is indicative of good, and whose absence would be a momentous evil".

Theophrastus³⁰⁸ notes that we are responsive to changing conditions of the atmosphere and that they make themselves felt in advance of the winds they portend.

Swelling of the feet indicated to a Greek a change to a south wind or, sometimes, a hurricane. A shooting pain in the right foot might signify the same thing³⁰⁹. Some of Joseph C. Lincoln's characters were even better barometers than were the Greeks. One of them, who was taken to sea because of his ability to forecast the weather, was reluctant to admit that humble things like bones provided him with second weather sight. When he was pressed to tell what particular bones gave him his clues he replied³¹⁰:

Why, my laig bones mostly. If a no'theaster's comin' my right laig sort of aches, and if it's a sou'-easter it'll fetch me in the left one. Then there's other—

An unsympathetic roar of laughter interrupted him. A few days later the captain disdainfully informed him of a Government prediction of a gale. The seer remonstrated³¹¹:

"Now, Cap'n Ez," he protested in an aggrieved tone, "ain't I been tryin' to git at you or Brad for four days or more? I know there was a blow comin'. She's come a-bilin', too. And I don't need no specs nuther."

One of Lincoln's short stories, *The South Shore Weather Bureau*³¹², is based on similar ability of another seer:

"Wall," drawls Beriah, "now to-day looks fine and clear, don't it? But last night my left elbow had

²⁹⁷Diodorus 2.30.4-5.

²⁹⁸*Ibidem*, 2.40.2.

²⁹⁹Lucan 10.206.

³⁰⁰Plutarch, *Lyander* 12.7.

³⁰¹Geoponica 1.12.

³⁰²*Ibidem*, 1.12.12-17.

³⁰³Catalogus Codicum Astrologorum Graecorum, 7.183-187. On page 182 the opinion is expressed that 'Eudoxius' is the same as Eudoxus of Cnidos.

³⁰⁴*Ibidem*, 183-184. Astrological lore of the winds is to be found in the same volume, on pages 156, 158, 159, 160, 165, 166. Other volumes in this publication give still other lore of the winds, chiefly in connection with thunder-calendars. I have listed some astrological weather lore in *THE CLASSICAL WEEKLY* 20.46-47, 22.30, 36.

³⁰⁵See, for example, *Gemini Elementa Astronomiae*, edited by Carolus Manitius, 210-233 (Leipzig, Teubner, 1898); *Claudii Ptolemaei Opera Quae Extant Omnia, Opera Astronomica Minora*, edited by J. L. Heiberg, 2.1-67 (Leipzig, Teubner, 1907).

³⁰⁶Plutarch, *Sertorius* 8.2-3. See also *Odyssey* 4.566-567.

³⁰⁷A. T. Burrows, *The Chinook Winds*, *Journal of Geography* 2 (1903), 136. <For the Chinook Wind see also above, page 19, column 2. C. K.>

³⁰⁸*De Ventis* 6.35.

³⁰⁹*Th., De Signis* 30.

³¹⁰Joseph C. Lincoln, *Partners of the Tide*, 311-312 (New York, A. L. Burt Co., 1905).

³¹¹*Ibidem*, 376.

³¹²Pages 55-73 of *Cape Cod Stories* (New York, A. L. Burt Co., 1907). The quotation will be found on page 59.

rheumatiz in it, and this morning my bones ache, and my right toe-joint is sore, so I know we'll have an easterly wind and rain this evening. If it had been my left toe, why —"

In Scarlet Sister Mary 299³¹³, the observation is made that "Worry-ation makes a misery worse dan east rain an' wind".

Samuel Butler is worth quoting on this aspect of weather lore³¹⁴:

For as old sinners have all points
O' th' compass in their bones and joints,
Can by their pangs and aches find
All turns and changes of the wind;
And better than by Napier's bones,
Feel in their own the age of moons. . . .

The ill effects of the south wind upon the human body are frequently noted. Theophrastus says that, during the prevalence of this wind, men felt more sluggish and less efficient, but the north wind made them energetic³¹⁵. Again, the south wind brought fevers³¹⁶ and affected the health in other ways³¹⁷.

The wind should be taken into account in town-planning. Examples of what not to do were numerous.

For example, Mytilene in the island of Lesbos is a town built with magnificence and good taste, but its position shows a lack of foresight. In that community when the wind is south, the people fall ill; when it is northwest, it sets them coughing; with a north wind they do indeed recover but cannot stand about in the alleys and streets, owing to the severe cold³¹⁸.

Similar reactions to the weather are still being felt³¹⁹:

Giordani felt storms coming four days in advance; Diderot said, 'It seems to me that I go crazy when the wind blows violently.' Maine de Biran said, 'In bad weather my mind and my will are not the same as when it is fine.' Alfieri wrote, 'I am like a barometer; I have always experienced, more or less, a greater ease of composition according to the atmospheric pressure; absolute stupidity when the great winds of the solstices and the equinoxes are blowing, an infinitely less penetration in the evening than in the morning.'

The comments of the ancients about the depressing effects of winds from across the Mediterranean will be borne out by anyone who has visited the classical lands in summer. Captain Smyth³²⁰ thus describes the sirocco as felt in Sicily:

The sirocco generally continues three or four days, during which period such is its influence, that wine cannot be fined³²¹, or meat effectually salted; oil paint, laid on whilst it continues, will seldom harden, but dough can be raised with half the usual quantity of leaven, and though blighting in its general effects in summer, it is favourable to the growth of several useful plants in winter. This wind is peculiarly disagreeable at Palermo, a city situated in a plain in the north-west part of the island, surrounded on the land side by

mountains, which collect the solar rays as if to a focus. Although inured to the heat of the East and West Indies, and the sands of Arabia and Africa, I always felt, during a sirocco, more incommoded by an oppressive dejection and lassitude than in those countries. At such times the streets are silent and deserted, for the natives can scarcely be prevailed on to move out while it lasts³²², and they carefully close every window and door of their houses, to exclude it.

The effects of the norther, a wind in the western part of our own country, are thus pictured³²³:

Human beings suffer from nervousness and headaches and become irritable and impatient. It is said that in the early days in California if a murder or any personal violence resulted from a quarrel which occurred during a norther that fact was taken into account as an extenuating circumstance. During a norther cattle are restless and cows are reported to give less milk than usual.

Captain Wm. H. Smyth's description³²⁴ of the rôle of the winds in Sicilian weather is both pertinent to classical study and interesting:

Whilst the sun is in the northern signs, the sky, although it seldom assumes the deep blue tint of the tropics, is, nevertheless, beautifully clear and serene; but after the autumnal equinox, the winds become boisterous, and the atmosphere hazy and dense; the dews and fogs increase, particularly on the coasts, and the rain falls in frequent and heavy showers.

In summer it is generally calm early in the morning, but a breeze springs up about nine or ten o'clock, freshens until two or three, and gradually subsides again into a calm towards evening. The winds are variable both in their force and their direction. The most prevalent are the northerly and westerly, which are dry and salubrious, producing, with the clearest sky, the most refreshing sensations. Those from the east round to southerly are heavy, and loaded with an unwholesome mist, often accompanied with heavy rain, thunder, and lightning, during which the luminous meteor, called by seamen *campasani*, (a corruption of *Corpo Santo*) is sometimes seen, and hailed with similar ideas to those which inspired the ancients on the appearance of their Castor and Pollux.

About the time of the vernal equinox, the force of the south-west wind is very sensibly felt along the shores of Trapani, Marsala, Mazzara, and Girgenti; but as the season advances the winds blow more from the northward, with fresh gales at intervals, which, however, are seldom experienced with violence in bays or harbours, and their power rarely continues longer than forty hours. The most experienced pilots say, that storms which commence in the day-time are more violent, and of longer duration than those which start up during the night.

REMARKABLE STORMS

Antiquity, like modern times, experienced storms which surpassed all previous storms within the memory of the oldest inhabitants. In the neighborhood of Ilerda in 49 B. C. Caesar's men encountered one so great that it was evident that there had never been a greater deluge of water in those places³²⁵. During a battle between Lucullus and Mithridates "a tempest of wind, the like of which had not been known in the

³¹³By Julia Peterkin (Indianapolis, The Bobbs-Merrill Co., 1928).

³¹⁴Hudibras, Part 3, Canto 2, 405-410.

³¹⁵De Ventis 10.56-59.

³¹⁶Arist., Prob. 1.23, 26.50; Th., De Ventis 10.57.

³¹⁷Arist., Prob. 1.24, 26.42. The general subject is discussed at considerable length by Hippocrates, De Aere, Aquis, et Locis, Chapters 1-6; Vitruvius 1.6.1-3; Celsus 2.1.

³¹⁸Vitruvius 1.6.1 (M. H. Morgan's translation [Harvard University Press, 1914]).

³¹⁹So The Literary Digest for August 7, 1926, page 21, quoting La Liberté (no date is given). It is with some misgiving that I quote from an unscholarly secondary source.

³²⁰Smyth (as cited in note 53), 5.

³²¹Compare Pliny 18.329 illinc <i.e. from the south> flatu veniente materiam vinumque, agricola, ne tractes.

³²²Compare Pliny 18.330 De ipsa regionis eius hora praemonuisse conveniat. Frondem medio die, arborator, ne caedito. Cum meridiem adesse senties, pastor, [aestate] contrahente se umbra, pecudes a sole in opaca cogito.

³²³R. DeC. Ward, The Climates of the United States, 417 (Boston, Ginn and Co., 1925).

³²⁴Smyth (as cited in note 53), 4-5.

³²⁵Caesar, De Bello Civili 1.48.1.

memory of man, tore down the tents of both, swept away the beasts of burden, and dashed some of their men over the precipices. Both sides then retreated for the time"³²⁶. Octavian's fleet was destroyed in 38 B. C. by a storm in which wind played a devastating part. It was entirely without parallel in the region of the straits of Sicily³²⁷.

Queer turns were sometimes given to accounts of weather in foreign countries. Diodorus³²⁸ thus describes the pranks of the wind in Gaul:

There happens throughout most of Gaul a strange and miraculous thing which we think it unseemly to pass by in silence. From the west and the north winds are wont to blow with such violence and power that they sweep from the ground stones as large as one can hold and a coarse cloud of pebbles. In the general violence of the storm they tear weapons and clothes from men and riders from horses.

The wind might be endowed with even greater magical properties³²⁹:

For in Dalmatia... a wind of great violence and exceedingly wild is wont to fall upon the country, and when this begins to blow, it is impossible to find a man there who continues to travel on the road, but all shut themselves up at home and wait. Such, indeed, is the force of the wind that it seizes a man on horseback together with his horse and carries him through the air, and then, after whirling him about in the air to a great distance, it throws him down wherever he may chance to be and kills him.

RAINS OF ANIMALS AND THINGS

To the power of the wind may be ascribed the superstitious belief in showers of various things, animate and inanimate, which are a subject of perennial interest, as is shown by rather frequent items in newspapers³³⁰. As often as they occur, their real nature is explained, sometimes with long lists of similar phenomena. Though superstitions about them continue and are widespread, they do not flourish with the vigor they attained in ancient Greece and ancient Italy, where rains of blood, milk, chalk, ashes, earth, animals, and miscellaneous objects struck awe into the hearts of even the educated. The most casual reading of Livy will reveal the dread which such events aroused³³¹. Occasionally, however, they might portend blessings. During performances in the theater in the consulship of Quintus Metellus and Titus Didius (98 B. C.) it rained chalk, an occurrence that signified welcome rains and good crops³³².

The literature on this general subject is voluminous³³³. It is my aim at this time merely to show that

some of the ancients knew that these terrifying phenomena were to be explained on physical grounds. The inclusion of the subject here is justified simply because the wind (or a wind-driven cloud) is the carrying agent.

A scholium on Homer³³⁴ states that on an occasion when there was a great war clouds picked up the bloody water in neighboring rivers and scattered it as bloody dew. This explanation is remarkable in that it removes the occurrence from the realm of the supernatural.

Pliny³³⁵ knew that stones and many other things were carried by the wind. In his account of the wanderings in Africa of the force under Cato the Younger Lucan³³⁶ shows that he understood perfectly well the nature of the phenomenon:

Galeas et scuta virorum
pilaque contorsit violento spiritus actu
intentusque tulit magni per inania caeli.
Illud in externa forsan longaque remota
prodigium tellure fuit, delapsaque caelo
arma timent gentes, hominumque erepta lacertis
a superis demissa putant. Sic illa profecto
sacrificio cecidere Numae, quae lecta iuventus
patricia cervice movet: spoliaverat Auster
aut Boreas populos ancilia nostra ferentis.

Procopius³³⁷ tells how ashes from Vesuvius rose to great heights and were borne by the winds to lands very far away.

And once, they say, they fell in Byzantium³³⁸ and so terrified the people there, that from that time up to the present the whole city has seen fit to propitiate God with prayers every year; and at another time they fell on Tripolis in Libya.

I am adding two references to the enormous literature of this subject. The first was written by a keen observer of things Sicilian, Captain Wm. H. Smyth³³⁹:

Waterspouts, and various singular meteoric phenomena, occur. Among the latter, on a warm, cloudy, hazy, day, the 14th of March, 1814, it began to rain in large drops, that appeared muddy, and they deposited a very minute sand of a yellowish-red colour. The wind, on the day before, had been blowing strongly from the south-south-west to the north-east, and during the time the rain fell was from the south-west, which leads to a supposition that it was transported from the deserts of Africa, though the first impression on the minds of the people in Messina, was, that an eruption of Mount Aetna had occurred.

R. C. Andrews³⁴⁰ has an interesting comment on a dust storm in China:

instances of rains of small toads and fishworms see Journal of American Folk-Lore 31 (1918), 10.

An interesting addition to the literature of this subject is G. Bidault de l'Isle, La Pluie de Sang du 30 Octobre 1926, La Nature 54 (1926), Supplément de Novembre 27, 189. The conclusion is reached that the coloring matter of such rains in France and elsewhere in Southern Europe has been carried from the deserts of Africa.

The limitless numbers in which flights of insects may gather, to be blown away to destruction, is well illustrated by a passage in Charles Darwin, The Voyage of the Beagle (Harvard Classics, 29, 172): "One evening, when we were about ten miles from the bay of San Blas, vast numbers of butterflies, in bands or flocks of countless myriads, extended as far as the eye could range. Even by the aid of a telescope it was not possible to see a space free from butterflies. The seamen cried out, 'it was snowing butterflies', and such in fact was the appearance."

³³⁴Scholium A on Iliad 11.53-54 (Dindorf's edition, 1.374).
³³⁵2.104.
³³⁶6.4.26-27 (H. B. Dewing's translation, in The Loeb Classical Library).

³³⁷In 472 A. D. ³³⁸Smyth (as cited in note 53), 6.

³³⁹On the Trail of Ancient Man, 24 (New York, Putnam, 1926).

³²⁶Appian, Romana Historia 12.88 (H. White's translation, in The Loeb Classical Library).

³²⁷Appian, Bella Civilia 5.90. ³²⁸5.26.1.

³²⁹Procopius 5.15.5-6 (H. B. Dewing's translation, in The Loeb Classical Library).

³³⁰The Chicago Tribune, for instance, devoted almost a column to the subject in its issue of April 17, 1927. The article is very valuable.

³³¹Livy 1.31.1-2; 3.10.6; 7.28.7; 10.31.8; 21.62.5; 22.1.9; 22.36.7; 24.10.8; 25.7.7; 26.23.5; 27.11.5; 27.37.1; 28.27.16; 29.10.4; 29.14.4; 30.38.8-9; 34.45.7-8; 35.9.4; 35.21.4; 36.37.3; 39.46.5; 40.19.2; 42.2.4; 42.20.5; 43.13.4; 44.18.6. Julius Obsequens likewise frequently mentions showers of various things.

³³²Julius Obsequens 47 (107).

³³³Numerous references have been collected by A. S. Pease, M. Tulli Cicronis De Divinatione, VI, 273-274 (University of Illinois Studies in Language and Literature, VI, VIII). In Transactions and Proceedings of the American Philological Association 51.112. I have collected a few references to showers of animals. For modern

The dust reached as far south <of Peking> as Shanghai and its yellow blanket hovered over the sea sixty-five miles beyond the coast. It came from a land parched by fourteen well-nigh rainless months which had cut a heavy toll of human life.

The wind manifests its power in other ways, notably in affecting water levels, which are sometimes raised and sometimes lowered. Many examples of this have been given in *THE CLASSICAL WEEKLY* 19.83-84, 126, 21.193, 22.40³⁴¹. When the north winds forced the waters back before Alexander as he was leading a brigade beyond Phaselis in Pamphylia, the impression was created that Heaven was helping the youthful conqueror³⁴².

RELIGION AND MAGIC

Naturally religion and magic play an important part in weather lore. Prayers and offerings³⁴³ were made to winds, and even altars³⁴⁴ and temples³⁴⁵ were erected in their honor. In return for their providential aid against the enemies of Thurii and Megalopolis the people of these cities conferred citizenship upon them³⁴⁶.

Like witches and magicians, deities were able to arouse the fury of the winds or to pacify them and to direct them for good or ill, as I have shown by many examples in a previous paper, *Magic and the Weather*, *THE CLASSICAL WEEKLY* 18.154-157, 163-166³⁴⁷. At this time I merely wish to add an ancient and a modern example of the retributive power of the winds. In the Homeric Hymn to Dionysus³⁴⁸ the pirates are represented as being afraid to do violence to the deity lest he stir up dangerous winds and heavy squalls. The Ancient Mariner was not so far-sighted in his treatment of the albatross³⁴⁹:

And I had done a hellish thing,
And it would work 'em woe:
For all averred, I had killed the bird
That made the breeze to blow.
Ah wretch! said they, the bird to slay,
That made the breeze to blow!

HIGH MOUNTAINS

Storms were supposed to be restricted to regions comparatively near the earth. Thus Aristotle tells us³⁵⁰ that on very high mountains such as Athos there were no winds. As proof he states that ashes of sacrifices on this mountain were undisturbed from one year to another. Plutarch held similar views³⁵¹, for he says that some mountains reach up into an air that is pure and free from moisture, so that upon their tops there is no cloud nor dew nor mist. Lucan adds³⁵² the thunderbolt to the list of things that belong to the lower regions:

fulminibus propior terrae succenditur aer
imaque telluris ventos tractusque coruscus
flammarum accipiunt: nubes excedit Olympus
lege deum. Minimas rerum discordia turbat,
pacem summa tenent³⁵³.

Goldsmith's Deserted Village has been aptly quoted in connection with this passage of Lucan³⁵⁴:

As some tall cliff that lifts its awful form,
Swells from the vale and midway leaves the storm,
Though round its breast the rolling clouds are spread,
Eternal sunshine settles on its head.

CAVES

Since the ancients believed in the existence of underground winds³⁵⁵, it is but natural that they should think of some of them as issuing from caves. Nemesianus refers³⁵⁶ to Thracian Boreas as coming from a cave, and an anonymous poem speaks of Circius as thundering in a cave³⁵⁷. At Senta, in Dalmatia, there was a wide-mouthed cave from which issued a whirlwind whenever a light object was thrown into it. It made no difference how tranquil the day might be³⁵⁸. In the Egyptian city of Thebes there was a cave in which calm prevailed on the thirtieth day (of the month), but on the other days there was wind³⁵⁹. The great troglodyte meteorologist was of course Aeolus³⁶⁰. I have twice referred to his activities in previous papers on weather lore³⁶¹.

WIND CYCLES

The ancients too had theories about cycles of weather. In the Bible³⁶² one reads that

The wind goeth toward the south, and turneth about unto the north; it whirleth about continually, and the wind returneth again according to his circuits.

The Bible does not tell how long it takes the wind to do this, but Eudoxus is more specific. According to Pliny³⁶³, Eudoxus thought that the winds and the weather in general had a cycle of four years. In my concluding paper I shall give references to wider aspects of this subject.

MODERN REFERENCES

In this paper I have given but few references to modern lore. Many examples of sayings and beliefs about the winds are gathered together by Richard Inwards, *Weather Lore: A Collection of Proverbs, Sayings and Rules Concerning the Weather*³, 79-90³⁶⁴, and by Fletcher S. Bassett, *Legends and Superstitions of the Sea and of Sailors in All Lands and at All Times*, 101-147³⁶⁵. Compare also Edward B. Garriott, *Weather Folk-Lore and Local Weather Signs*, 6-8³⁶⁶; T. Morris

³⁴¹See also Lucretius 6.112-720; Cassius Dio 39.61.1.

³⁴²Arrian, *Anabasis* 1.26.

³⁴³Paul Stengel, *Der Kult der Winde, Opferbräuche der Griechen*, 146-153 (Leipzig and Berlin, 1910).

³⁴⁴Pausanias speaks (9.34.3) of an altar to the winds at Coronea.

³⁴⁵Seneca 5.17.4; Greek Anthology 6.53.

³⁴⁶Aelian, *Varia Historia* 12.61; Pausanias 8.27.14, 8.36.6.

³⁴⁷I should like to add a reference to W. R. Roscher, *Ausführliches Lexikon der Griechischen und Römischen Mythologie*, Hermes als Wind- und Luftgott, Volume 1, Part 2, 2360-2362.

³⁴⁸Homeric Hymn 7.22-24.

³⁴⁹Coleridge, *The Rime of the Ancient Mariner*, Part II, Stanza 3. See J. L. Lowes, *The Road to Xanadu*, 224-228 (Boston and New York, Houghton Mifflin Company, 1927).

³⁵⁰Arist., *Prob.* 26.36.

³⁵¹Moralia 951 B. See also Odyssey 6.43-45; Lucretius 3.18-22.

³⁵²2.269-273.

³⁵³Compare Seneca, *Dialogi* 5.6.1. Pars superior mundi et ordinatio ac propinqua sideribus nec in nubem cogitur nec in tempestatem impellitur nec versatur in turbine. Omni tumultu caret; inferiora fulminantur.

³⁵⁴By C. E. Haskins, in his edition of the *Pharsalia*, page 52 (London, George Bell and Sons, 1887).

³⁵⁵See, for example, Pliny 2.114. ³⁵⁶Cynegetica 273.

³⁵⁷Incerti Versus De Duodecim Ventis 6. ³⁵⁸Pliny 2.115.

³⁵⁹Antigonus, *Historia Mirabilium* 126 (139).

³⁶⁰Vergil, *Aeneid* 1.50-63; Ovid, *Metamorphoses* 1.262-264.

³⁶¹*THE CLASSICAL WEEKLY* 18.156, 23.6.

³⁶²Ecclesiastes 1.6. ³⁶³2.130.

³⁶⁴London, Elliot Stock, 1898.

³⁶⁵Chicago and New York, Belford, Clarke and Co., 1885.

³⁶⁶United States Department of Agriculture, Weather Bureau, Washington, 1903.

Longstreth, Reading the Weather, 76-86³⁶⁷; D. E. Marvin, Curiosities in Proverbs, 212-214³⁶⁸; O. Freiherr von Reinsberg-Duringsfeld, Das Wetter im Sprichwort, 41-45³⁶⁹; C. Swainson, A Handbook of Weather Folk-Lore, 218-228³⁷⁰; Edward Vernon, Is It Going to Rain?, 2 63-66, 71-73³⁷¹. For such popular signs as are dependable the reasons are given by W. J. Humphreys, Weather Proverbs and Paradoxes, 59-63³⁷².

The wind has, of course, been mentioned many times in my previous papers on weather lore, especially in the last four. In this paper I have repeated but two or three small items. Cross-references have been given only to pages containing considerable material.

Thunder and lightning still remain upon my weather calendar. They, too, have been mentioned many times in other articles, but there are certain popular ideas about them upon which I have not yet touched.

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REVIEWS

Petronius, The Satiricon. Edited, with Introduction and Notes, by Evan T. Sage. New York and London: The Century Co. (1929). Pp. xl + 228.

Professor Sage's edition of Petronius is the first number I have seen of the new series, The Century College Latin Series: if other volumes reach the standard set by this, the series should command a great success. I may perhaps refer to two small defects. One is that the covers of my copy tend to bulge outwards, the other that the columns of the text strike me as too narrow in proportion to their height. In other respects the format is admirable.

The present volume opens with a well written and interesting Introduction¹. The author prefers the term "Informal Latin" to 'colloquial' or 'vulgar' Latin, but there is a certain vagueness in his term. Does it include the Sermo Cotidianus? Is the style of Encolpius in Petronius formal or informal? Mr. Sage calls it literary: I should call it colloquial. I do not see what is gained by dropping the tripartite division, represented e. g. by (a) Cicero's speeches and Livy, (b) the comedies and Cicero's letters (and the ordinary narrative of Encolpius), (c) the speech of Trimalchio's circle². The following remark by Professor Sage (xxix-xxx) is illuminating:

...It is only partly correct to speak of writers like Fronto as archaizers: they did deliberately imitate older writers like Cato, but the natural tendency of the

language was drawing them closer to Cato's standard without any imitation.

The text shows individual judgment; it is a very good text, so far as I have tested it. It is a pity there are no critical notes of any kind, as the editor has given much attention to the manuscript tradition.

I do not know why unmetrical verses are printed. For such verses see § 5, line 1 *Artis severae si quis amat effectus*, 23.3, line 1 *Huc huc convenite nunc, spatulocinaedi*, 93.2, line 2 *Et pictis avis renovata pinnis*, and 132.15, line 7 *Ipse pater veri doctus Epicurus in arte*. . . . In 79.8, line 1 *Qualis nox fuit, dii deaeque, illa* should be inserted after *fuit*. In 80.9, last line, *Vera redit facies, dissimulata perit*, *dissimulata* must be wrong. On page 68, line 1 for *Non bibit inter aquas nec poma pendentia carpit* read *Non bibit inter aquas poma aut pendentia carpit*; in 133.3, line 17 for *Circa delubrum gressum feret ebrius pubes* read *Circa delubrum gressum feret ebria pubes*; in 135.8, line 9 for *Fortuitoque luto clavus numerabat agrestes* read *Fortuitoque luto clavos numerabat agrestes*.

The notes are numerous and, in general, very sound, but in my judgment they are too brief. I will mention a few points in the notes on the Banquet, the most difficult part from the point of view of the annotator.

26.7.—*libera cena* is not Latin for a "free meal" in the modern sense. . . .

27.2.—Surely not to use the same ball twice must be a sign of luxury, not part of the game.

29.6-8.—The notes on the meaning of *pensa*, on *ipsius* (there is no reference to Greek), and *multaceam* are so short as to be without value. Those on *textorum dicta* (33.3) and *Opimianum* (34.6) seem wrong. The joke in 34.6 would be paralleled, for an Englishman, by labelling port 'Comet Port 100 years old'. In Chapter 35 I cannot believe (in spite of De Vreese³) that Petronius intended Trimalchio to show an accurate knowledge of *anything*. The notes on 37.10 *babaecalis*, 38.1 *credrae*, 38.13 *sociorum* do not satisfy me, nor do those at 41.2, 43.3, 43.4 (*involavit*), 43.7 (*quadrata*), 43.8 (*Minerva*), 44.5, 44.9. I need not enter into further details; in general I should say there are too many cases where a reference to Greek or a quotation from another author that would be illuminating is not given, and too many strange and interesting forms are passed by with a rough paraphrase, e. g. *flicem*, *cicaro*, *stelio*, *lamna*, *mufrius*, *varato*, *mantissa*, *ascia*, *cusuc*, *pharmace* (the note here is wrong).

There is no doubt whatever about the game of 64.12: *pax Palamedes* is explained in Heraeus's Index.

To my mind the best part of the book is that which contains the extremely interesting Supplementary Notes, on Petronius and the Milesian Tale (197-198), The Literary Influence of Petronius (198-199), The Satyricon and Satire (199-203), The Place and Date of the Cena (203-204), The Realism of Petronius (204-206), The Literary Theory of Petronius (206-208), The Troiae Halosis and Nero (208-210), The Book Division of the Satiricon (210), The "Short Cut"

³⁶⁷New York, Macmillan, 1925.

³⁶⁸New York and London, G. P. Putnam's Sons, 1916.

³⁶⁹Leipzig, Herman Fries, 1864.

³⁷⁰Edinburgh and London, Blackwood and Sons, 1873.

³⁷¹Edinburgh, Macniven and Wallace, no date.

³⁷²Williams and Wilkins Co. (Baltimore, 1923).

¹For the contents of the volume see the review by Dr. Hadas, THE CLASSICAL WEEKLY, 24.16. Mr. Sedgwick gives, below, the items of the Supplementary Notes. C. K. >.

²Reference may be made here to an article entitled Formal Latin and Informal Latin, by Charles L. Durham, THE CLASSICAL WEEKLY 6.97-101, and to a paper entitled A Characterization of Gallic Latin, by George D. Kellogg, THE CLASSICAL WEEKLY 6.90-94. See also the chapter entitled The Latin of the Common People, which covers pages 32-78 of Frank Frost Abbott, The Common People of Ancient Rome (New York, Charles Scribner's Sons, 1911). C. K. >.

³The reference here is to Jacques de Vreese, Petron 39 und die Astrologie, reviewed by Professor R. G. Kent, THE CLASSICAL WEEKLY 22 (1928), 119. C. K. >.



Classical Weather Lore of Thunder and Lightning

Author(s): Eugene S. McCartney

Source: *The Classical Weekly*, Vol. 25, No. 23 (Apr. 25, 1932), pp. 183-192

Published by: [Classical Association of the Atlantic States](#)

Stable URL: <http://www.jstor.org/stable/4339100>

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1549. Ariosto dedicated his Orlando Furioso to him. "It is a matter for no small wonder that this high pressure business man and super-politician, son of a wild woman, if there ever was one, was able to bequeath to posterity a magnificent villa like the one at Tivoli... <which> is generally admitted to be the finest Renaissance garden in Europe, and is justly world famous".

E. S. GERHARD,
Secretary-Treasurer

THE WEREWOLF IN CALABRIA

In an article entitled Popular Superstitions in Petronius and Italian Superstitions of To-day, in THE CLASSICAL WEEKLY 22.83-86, Mr. Anthony Rini discusses the werewolf superstition as told in Petronius, Cena Trimalchionis 61-62, and gives instances of its survival in Italy to-day. Another illustration of this survival is found in Norman Douglas's book, Old Calabria, 176¹. He was driving from Spezzano to Vaccariza one night in the summer of 1911.

... We passed a solitary man, walking swiftly with bowed head. What was he doing there?

"Lupomanaro," said the driver.

A werewolf....

I had always hoped to meet with a werewolf on his nocturnal rambles, and now my wish was gratified. But it was disappointing to see him in human garb—even werewolves, it seems, must march with the times. This enigmatical growth of the human mind flourishes in Calabria, but is not popular as a subject of conversation. The more old-fashioned werewolves cling to the true *versipellis* habits, and in that case only the pigs, the inane Calabrian pigs, are dowered with the faculty of distinguishing them in daytime, when they look like any other "Christian." There is a record, in Fiore's book, of an epidemic of lycanthropy that attacked the boys of Cassano. (Why only the boys?) It began on 31 July, 1210; and the season of the year strikes me as significant.

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AURIBUS LUPUM: TERENCE, PHORMIO 508 A PROVERB AND A PARALLEL

In the Phormio of Terence, Antipho *adulescens* quotes a proverb to express his feeling as to the uncertainty of the continuance of his marriage (506-507):

Mihin domist <uxor>? Immo, id quod aiunt, auribus teneo lupum, nam neque quo pacto a me amittam neque uti retineam scio.

This was a Greek proverb, according to Donatus: compare the note on the passage in the fourth version of Karl Dziatzko's edition of the Phormio, by Edmund Hauler (Leipzig, Teubner, 1913). Suetonius (Tiberius 25) quotes Tiberius as referring to this proverb in speaking of the difficulties before which he hesitated at the beginning of his reign: ut saepe lupum se auribus tenere diceret.

An actual instance illustrating this proverb is described by Sir Wilfred Plunt in My Diaries 2.4 (New York. Alfred A. Knopf, 1923). He was at his country

^{<1>}I give the reference to the edition published by Martin Secker, in the 1923 reprint of the second edition [1920]. The book was first published in 1915. See also pages 236-237 of the edition of the book in the Modern Library (New York, Modern Library, Inc., 1928). C. K. >.

home in Egypt when the incident occurred, in February, 1901. A native boy was in the kitchen when ... what he thought was a dog, but which really was a wolf, looked in at the door. The boy turned to drive it out when it sprang up at him and bit him on the hands. He caught it, however, by the throat (or rather, he afterwards explained, by the ears, which he said he could not let go, thus illustrating the proverb) while an old woman who was also there beat it with a log of wood. Then others came, and the boy still holding fast, they got the rope round its neck. ... The old woman ... at once when the wolf was dead took some hairs from him to dress her wound with, and the heart was kept for the boy to eat.

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CLASSICAL WEATHER LORE OF THUNDER AND LIGHTNING¹

Although I have mentioned thunder and lightning many times in my previous work^{2a} on the weather lore of the Greeks and the Romans, I have been saving most of my material on this subject for separate papers². The lore of the violent manifestations of the heavens is inexhaustible, but I shall confine myself rather closely to the weather aspects of thunder and lightning. Omens concern me only as they are related to the weather. Doubtless the third volume of A. B. Cook's great work on Zeus will explore all territory that I leave untrodden³.

In the popular weather lore of to-day there are doubtless many superstitions which have come down to us from antiquity, but it is difficult, if not impossible, to pick them out with a fair degree of assurance. Peoples that have had no cultural contacts may have similar or identical beliefs, especially if there is some basis for the beliefs. The Japanese say⁴, as did the Greeks and the Romans⁵, that the swallow flies low before a storm, but, since under such conditions the swallow is

^{<1>}After this article was accepted for publication, I was fortunate enough to secure from friends of the Classics substantial contributions toward defraying the cost of publishing it. C. K. >

^{2a}All these articles have appeared in THE CLASSICAL WEEKLY, as follows: An Animal Weather Bureau, 14.89-93, 97-100; The Folk Calendar of Times and Seasons, 16.3-7; The Plant Almanac and Weather Bureau, 17.105-108; Magic and the Weather in Classical Antiquity, 18.154-157, 163-166; The Classical Astral Weather Chart for Rustics and Seamen, 20.43-49, 51-54; Greek and Roman Weather Lore of the Sun and the Moon, 22.25-31, 33-37; Clouds, Rainbows, Weather Galls, Comets, and Earthquakes as Weather Prophets in Greek and Latin Writers, 23.2-8, 11-15; Greek and Roman Weather Lore of Winds, 24.11-16, 18-24, 25-29.

^{2b}A kindred topic, St. Elmo's Fire, I reserve for a later paper.

³The following abbreviations are used: Astrol. Graec. = Catalogus Codicum Astrologorum Graecorum (Brussels, H. Lamertin, 1898-); Cook = A. B. Cook, Zeus, A Study in Ancient Religion, I-II (Cambridge: At the University Press, 1914, 1925); D. = H. H. C. Dunwoody, Weather Proverbs, Signal Service Notes, No. IX, Washington, Government Printing Office, 1883; Fiedler = W. Fiedler, Antiker Wetterzauber, Erstes Heft, Würzburger Studien zur Altertumswissenschaft (Stuttgart, Kohlhammer, 1931); Frazer = J. G. Frazer, The Magic Art and the Evolution of Kings (London, Macmillan, 1917); Lydus = Lydus, De Ostentis (C. Wachsmuth's edition, Leipzig, Teubner, 1897); Pauly-Wissowa = Pauly-Wissowa, Real-Encyclopädie der Classischen Altertumswissenschaft; Pliny = Plinius, Naturalis Historia; Roscher = W. H. Roscher, Ausführliches Lexikon der Griechischen und Römischen Mythologie; Schweizerisches Archiv = Schweizerisches Archiv für Volkskunde; Seneca = Seneca, Naturales Quaestiones; Th. = Theophrastus, De Signis; Thomas = Daniel L. Thomas and Lucy B. Thomas, Kentucky Superstitions (Princeton University Press, 1920). The references to this work will be to item or items, not to page or pages. Several references will be made to Handwörterbuch des Deutschen Aberglaubens, edited by Eduard Hoffmann-Krayer (Berlin and Leipzig, Walter de Gruyter and Company, 1928-).

⁴W. C. Fegen, Japanese Weather Wisdom, Trans-Pacific 16 (1928), 6.

⁵See THE CLASSICAL WEEKLY 14.90.

merely pursuing insects that have been driven down by a heavy atmosphere, the folklore of any number of nations might contain the same item. In contemporary lore of thunder and lightning it would be difficult to prove that more than a few items are direct legacies from antiquity, but one is on firmer ground in asserting that the ancient attitude toward these elements survives. To show the continuity of feeling I shall introduce more parallels than I did in previous papers.

WEATHER SIGNS DERIVED FROM THUNDER AND LIGHTNING

Many of the ancients thought of thunder and thunderbolts as causing rain and heavy storms⁶. In the *Iliad*⁷ flashes of lightning, which are elsewhere said to occur when clouds lose their density⁸, indicate that Zeus is preparing a deluge of rain or hail, or even of snow, if it is the season when snow has covered the fields.

Seneca explains⁹ that, when a quarter of the heavens which has air inclosed within clouds is charged with moisture, the exit of the moisture is prevented until the thunder begins; hence thunder of this type is a sure sign that rain is to follow. Passages like this help us to understand Socrates's remark¹⁰ after Xanthippe had climaxed a tirade by throwing water upon him, 'Did I not tell you that Xanthippe's thundering would cause rain too?' This story reminds one of a line in Shakespeare¹¹: "If Talbot do but thunder, rain will follow".

This popular association of thunder and rain can be readily paralleled from the Bible¹²:

When he uttereth his voice there is a multitude of waters in the heavens, and he causeth the vapours to ascend from the ends of the earth; he maketh lightnings for the rain, and bringeth forth the wind out of his treasuries.

In general, thunder and lightning indicate storm coming from the directions in which they occur, but, if lightning comes at times from the south, at times from the north, at times from the east, then rain may be expected from these directions and wind will be added¹³. Lightning in the north and thunder in the east occurring simultaneously herald storm¹⁴. When vivid lightning does not remain in the same quarter, storm will follow¹⁵.

But when from East and South the lightnings flash, and again from the West and anon from the North, verily then the sailor on the sea fears to be caught at once by the waves beneath and the rain from heaven. For such lightnings herald rain¹⁶.

The weather signs derived from thunder and lightning at different times of the day and the year and from different quarters of the heavens under various

conditions are nowhere else so satisfactorily listed as in Theophrastus, *De Signis*¹⁷:

Thunder in winter and at dawn indicates wind rather than rain; thunder in summer at midday or in the evening is a sign of rain. If lightning is seen from all sides, it will be a sign of rain or wind, and also if it occurs in the evening. Again, if when the south wind is blowing¹⁸ at early dawn, there is lightning from the same quarter, it indicates rain or wind. When the west wind is accompanied by lightning from the north, it indicates either storm or rain. Lightning in the evening in summer time indicates rain within three days, if not immediately. Lightning from the north in late summer is a sign of rain.

If lightning comes from all sides, it indicates rain, and from any quarter from which the flashes come in quick succession there will be wind. In summer from whatever quarter lightning and thunder come, there will be violent winds¹⁹: if the flashes are brilliant and startling, the wind will come sooner and be more violent; if they are of gentler character and come at longer intervals, the wind will get up gradually. In winter and autumn however the reverse happens, for the lightning causes the wind to cease: and, the more violent the lightning and thunder are, the more will the wind be reduced. In spring I consider that the indications would not so invariably have the same meaning,—and this is also true of winter.

If, while a south wind is blowing, there comes lightning from the north, the wind ceases. If there is lightning at dawn, the wind generally ceases on the third day: other winds than a south wind however do not cease till the fifth, seventh or ninth day, though a wind which got up in the afternoon will cease sooner....

...Those <winds> which are accompanied by lightning are the north-north-west the north-west the north and the north-north-east....²⁰

In Italy it is from other directions that thunder and lightning come. Voltumnus is called *altitonans* and Auster is described as *fulmine pollens* in autumn²¹.

Other details are given by Pliny²² about the weather significance of thunder and lightning. When in summer it thunders more violently than it lightens, wind is to be expected from the direction in which these phenomena are heard and seen, but, if it thunders less violently, rain is to be expected. When it thunders and lightens in a clear sky, there will be storm, which, however, will be fiercest when it lightens from all quarters of the heavens; when it thunders from the direction of Aquilo, rain is portended for the following day; when it thunders from the north, wind is to be looked for from that quarter. When on a clear night it lightens in the direction of Auster or Corus or Favonius, wind and rain from these directions are to be expected.

We have seen that, under various conditions, thunder and lightning at certain periods of the day and night give indications of the weather that is to come. It is stated, however, without any attendant conditions, that thunder in the morning signifies wind, thunder at midday, rain²³. Lydus²⁴ says that, when thunder and

⁶See e.g. Servius on Aeneid 11.259...quando manubiae Mineravales, id est fulmina, tempestates gravissimas commovent; Lucretius 6.259...fulminibus gravidam tempestatem....

⁷10.5-7. ⁸Lucretius 6.214. ⁹2.27.1-2. ¹⁰Diogenes Laertius, Socrates 5.17.36. Compare Plutarch, *Moralia* 461 D-E. ¹¹I Henry VI 3.2.59.

¹²Jeremiah 10.13. Compare Jeremiah 51.16; Psalms 135.7. One of our sayings, as recorded by D. 80, is that "Lightning brings heat".

¹³Geoponica 1.3.3. ¹⁴Isidorus, *De Natura Rerum* 38.2.

¹⁵Th. 43.

¹⁶Aratus, *Phaenomena* 933-937 (I give G. R. Mair's translation, in *The Loeb Classical Library*). Compare Vergil, *Georgics* 1.370-373: At Boreae de parte truci cum fulminat et cum Eurique Zephyrique tonat domus, omnia plenis rura natant fossis, atque omnis navita ponto umida vela legit.

¹⁷The first four paragraphs that follow are Sections 21, 32, 33, 37, respectively. All translations in this paper of passages from this work are from the version of Theophrastus, *De Signis*, by A. Hort, in *The Loeb Classical Library*. <They are reproduced exactly. The punctuation in Mr. Hort's rendering leaves much to be desired. C. K.>.

¹⁸Compare Sophocles, *Ajax* 257-259; Aristotle, *Problemata* 26.20. ¹⁹Compare Aratus, *Phaenomena* 924-925; Geoponica 1.11.8.

²⁰Compare Aristotle, *Meteorologica* 2.6, 364 b.

²¹Lucretius 5.743-745.

²²Pliny 18.354.

²³*Ibidem*.

²⁴De Ostitentis 41.

lightning occur at night with the moon in Scorpio, prayers should be raised that the lives of men may not be blotted out by bolts.

An imposing list of signs derived from thunder is to be found in *Catalogus Codicum Astrologorum Graecorum* 7.226-230²⁵. This gives the significance of thunder by day or night for each month of the year. For example, if it thunders or lightens by day in May, there will be a downpour of rain and hail, and rivers and springs and seas will be disturbed. The sea will be rough; one should keep away from it. Thunder by night means good crops, but an excess of rain and wind and overflow of springs, and the air will not be clear.

We, too, draw indications of the weather from the direction in which lightning is seen. In popular lore it is believed that "if there is lightning in the north it will rain in twenty-four hours; lightning in the south means dry weather"²⁶. "Lightning under North Star will bring rain in three days". "Thunder-storm from NW. is followed by fine, bracing weather; but thunder and lightning from NE. indicates <sic> sultry, unsettled weather". "Thunder in the north indicates cold weather and rain from the west". "Thunder from the south or southeast indicates foul weather, from the north or northwest fair weather"²⁷.

According to other beliefs²⁸,

Lightning in the north is a sign of dry weather.

If you see lightning in the northwest, it will rain within forty-eight hours.

If there is lightning in the east, one may look for dry weather.

In a popular book on woodcraft it is stated that "A storm that comes against the wind is always a thunder-storm"²⁹.

Ancient lore of the significance of thunder and lightning at various periods of the day and the night has some modern counterparts.

Le tonnerre du matin annonce du vent; celui du midi, de la pluie; celui du soir, l'orage³⁰.

Quand bruit du tonnerre vers midi s'entend, la pluie bientôt descend³¹.

According to lore of northeastern Scotland,

Thunder in the forenoon is said to be followed by a breeze from the north or north-east. Thunder in the afternoon is followed by fine warm weather (Rose-hearty)³².

Other counterparts are as follows:

Lightning at night without thunder is commonly called "fire flaucht", and is looked upon as the precursor of windy weather (general), "flaughty weather" (Pittulie). About the month of September it indicates a westerly breeze, and within no long time after its appearance. Thus if it appears early in the evening the breeze springs up by morning³³.

Sheet lightning at night is a sign of hot weather³⁴. Thunder after midnight means that the next day will be lowery³⁵.

²⁵See also 8, Part III, 123-125, 168-169.

²⁶Carl Sandburg, *Abe Lincoln Grows Up*, 126 (New York, Harcourt, Brace and Company, 1926); D. 81; Thomas 2559, 2563.

²⁷D. 81-82.

²⁸Thomas 2560-2562.

²⁹Ernest Thompson Seton, *The Book of Woodcraft*, 116 (Garden City, New York, Doubleday, Page and Company, 1922).

³⁰Les Littératures Populaires de Toutes les Nations 46 (1902), 306.

³¹Schweizerisches Archiv 26 (1926), 13.

³²Folk-Lore 2 (1891), 475.

³³*Ibidem*.

³⁴Journal of American Folk-Lore 40 (1927), 186, No. 971.

³⁵C. Johnson, *What They Say in New England*, 26 (Boston, Lee and Shepard, 1897).

PREDICTION OF THUNDER AND LIGHTNING

We have seen that weather signs were drawn from electric phenomena. But thunder and lightning themselves had heralds. A shooting star caused storm, with thunder, thunderbolts, and lightning³⁶. A flashing star coming from the north and making fiery furrows through the air was regarded as a sign of thundering and of a fiercer wind from the north³⁷.

Popular English weather lore of two hundred years ago pretended to be able to predict thunder and lightning³⁸:

It has been the Observation of those that have had many Years Experience of the Weather, that when the *Wind* in the Summer Time has been *South* two or three Days together, and it grows very Hot; and when you see *Clouds* arise with great *White Tops* like *Towers*, as if one *Cloud* were on the *Top* of another, and join'd together with *Black* on the *Nether Side*, that then it is like to be *Thunder* and *Rain* suddenly in many *Places*.

If there arise two such *Clouds* with *Thunder* in them, the one on the one *Side* of you, and the other on the other, then beware.

Another sign of approaching *Thunder*, are *Meteors* shooting in the *Night* in Summer-time, for they shew the *Air* to be inflam'd with much *Heat*, and consequently that *Thunder* and *Lightning* will ensue.

Likewise many *Chops* and *Clefts* in the *Ground*, shew that abundance of *Nitrous* and *Sulphureous Vapours* have been exhal'd from the *Earth*, and got up amongst the *Clouds*, and there being impatient of *Restraint*, after long struggling and rumbling, at last take *Fire* and burst through with a great *Noise*, which we call *Thunder*, and a sudden *Flash* which we call *Lightning*...

If no *Clouds* appear in sultry *Weather*, and the *Sun* sets *Red* and *Fiery*, great flashes will appear in the *North* and *North-West*, which is call'd *Fulgetrum*, or *Lightning without Thunder*...

The exhalations referred to in the next to the last paragraph of this quotation recall a striking passage in Helen Keller's book, *The Story of My Life*³⁹. When she was a child, her teacher left her temporarily amid the branches of a tree.

Suddenly a change passed over the tree. All the sun's warmth left the air. I knew the sky was black, because all the heat, which meant light to me, had died out of the atmosphere. A strange odour came up from the earth. I knew it, it was the odour that always precedes a thunderstorm, and a nameless fear clutched at my heart.

The odor is generally described as that of sulphur. In *Cymbeline*⁴⁰, Shakespeare says of a descent of Jupiter in thunder and lightning, "He came in thunder; his celestial breath was sulphurous to smell". He is doubtless simply borrowing a common classical notion. In antiquity the peculiar odor noticed during thunderstorms was generally referred to as the odor of sulphur⁴¹. Seneca says⁴², "Wherever the thunderbolt falls, there the odor of sulphur is sure to be". Homer⁴³ and several other writers⁴⁴ would have us believe that the fire of the bolt is burning sulphur. Another writer⁴⁵ states that

³⁶Pliny 2.112. ³⁷Lydus 4.

³⁸John Pointer, *A Rational Account of the Weather* . . . , 102-103 (London, 1738).

³⁹See page 26 (New York, Doubleday, Page and Company, 1903).

⁴⁰5.4.114-115.

⁴¹Iliad 14.415; Odyssey 12.417; Lucretius 6.219-221; Pliny 35.

⁴²177; Seneca 2.21.2.

⁴³2.53.2. ⁴⁴Iliad 8.133-135.

⁴⁵Persius 2.24-25; Lucan 7.157, 160; Statius, *Thebais* 11.17.

⁴⁶Nemesius, *De Natura Hominum* 5.12.

there is sulphur in the stone into which the thunderbolt changes on cooling; he describes the sulphur as 'cooled fire, so to speak'. The sulphur dug up in the land of the Sodomites was regarded as proof that this country had been destroyed by bolts⁴⁶.

STARS AND PLANETS

There was a belief that the stars and the planets caused thunderbolts. Just as a spark sputters from burning wood, so celestial fire sputters from a star⁴⁷. According to Pliny⁴⁸, fire dropped on the clouds from the stars. If the wind or vapor was struggling in the clouds, thunder was caused by the impact upon the condensed air; if either broke out with a flame, there were thunderbolts; if either was slow in forcing its way out, there were only flashes of lightning. Even the sun was sometimes regarded as the cause of thunderbolts⁴⁹.

Some thought that the fires which fell from the heavens came from the three most distant planets known to the ancients, Saturn, Jupiter, and Mars, but chiefly from Jupiter⁵⁰. The Babylonians, too, attributed thunderbolts to three planets⁵¹, evidently the same three. The Romans held that planets caused a cessation of clear weather when they were entering or leaving signs of the zodiac⁵².

Mars abounded in lightnings and winds⁵³; Mercury caused thunder and lightning⁵⁴. Sluggish Saturn rarely sent forth bolts⁵⁵, but it was inclined to cause them and very heavy rains when it was in Capricorn, and to cause hail and winds when it was in Scorpio⁵⁶. If Saturn absorbed all the sun's rays, there occurred thunder and lightning. If Mars was in conjunction with Saturn, the lightning was forked⁵⁷.

When Jupiter was in Scorpio in the house of Ares, the position indicated, among other things, that the spring would be stormy until the solstice, with rain and thunderbolts⁵⁸. When Jupiter was in Aquarius in the house of Cronus, one should pray that there would not be plagues and earthquakes and thunderbolts⁵⁹.

Germanicus Caesar, in the third section of his *Prognostica*⁶⁰, gives a most interesting list of weather data derived from the presence of Jupiter, Mars, Venus, and Mercury in the signs of the zodiac, near other stars. I shall give an example for each planet.

Jupiter thunders in Aries and through the back of African Leo⁶¹. There are moderate rains when Mars touches the horns of Taurus, or the fruit-bearing

goddess, or solstitial Capricorn⁶². Venus, when she is coming above Taurus, hides the lands with dark rains and thunder and frequent hail⁶³. On being visited by Mercury, Aquarius becomes cold and bristles with swift east winds, and also arouses solstitial rains and shakes the clouds with continuous bolts accompanied by crashing thunder⁶⁴. In the same section of the *Prognostica*⁶⁵ there are other references to weather associations of these planets with thunder and lightning.

In modern works on astrology it is stated that the planets in certain positions exercise influence on the weather. I quote—exactly—three examples⁶⁶:

Saturn in conjunction, square or opposition of the Sun, in the spring denotes cold, rain, or hail; in summer much rain, with thunder and lightning, according to the nature of the sign; in autumn tempestuous, stormy weather; and in winter grievous cold, snowy, slabby weather.

Mars in conjunction, square, or opposition of the Sun, in fiery signs, promiseth drought in summer, dry air in the spring, in autumn and winter frost; in watery signs, showers in the spring, in summer thunder and rain, in autumn showers, in winter rain and cold.

Jupiter in conjunction, square, or opposition of Mars shows the spring to be windy and tempestuous; a thundering and lightning summer; rain and storms in autumn; and in winter cold snows and sharp winds, according to the nature of the signs.

ASTRO-METEOROLOGY

As was shown in a previous paper, *The Classical Astral Weather Chart for Rustics and Seamen*, THE CLASSICAL WEEKLY 20.43-49, 51-54, there was much astro-meteorology in antiquity. Any chart of the rising and the setting of stars would list the kinds of weather that were supposed to attend these events. In fact, this was sometimes the sole purpose of making a chart. A writer might compile such information with the needs of farmers in his mind, as we may see from Columella's systematic mention of stars and weather in his *De Re Rustica*⁶⁷.

It is obvious that Ptolemy's catalogue of fixed stars⁶⁸, with its five hundred and eighty⁶⁹ references to such stars, was compiled as a weather log-book. Thunder and lightning, however, are not often specifically mentioned by Ptolemy, although of course they occurred during storms and tempests. With the assurance of a modern almanac the chart makes prophecies for each and every day of the year. A few examples may be given ("Thoth", etc., are the Egyptian names of the months: I have extracted from Ptolemy such material as seemed pertinent).

⁴⁶Philo Iudaeus, *De Abrahamo* 27.

⁴⁷Pliny 2.82. Compare 2.138...nec a sideribus <fulmina> venientia. . . .⁴⁸2.112.

⁴⁹Lydus 46.

⁵⁰Pliny 2.82. Compare *Prognosticorum Reliquiae* 2.4-5, 3.263-265 (in *Germanici Caesaris Aratea Cum Scholiis*, Edited by Alfred Breysig, 43, 48 [Berlin, G. Reimer, 1867]).

⁵¹Pliny 2.191. ⁵²Vegetius 4.40.

⁵³Lucan 10.206. Compare Ptolemy *Tetrabiblos* 2.7, and *Astrol. Graec.* 1.135. We learn from Pliny 2.139 that bolts from Mars were especially incendiary.

⁵⁴Ptolemy, *Tetrabiblos* 2.7; *Astrol. Graec.* 1.136. See also 7.221.

⁵⁵Germanicus Caesar, *Prognosticorum Reliquiae* 2.25 (in the edition named in note 50, above).

⁵⁶Servius on Vergil, *Georgics* 1.336. See also Vergil, *Georgics* 1.135-137. As Servius suggests, one could tell from the state of the weather in what sign Saturn was.

⁵⁷Epigenes, as quoted in derision by Seneca 7.4. For a modern example of weather lore of conjunction of planets see Shakespeare, *II Henry IV* 2.4.286-287, "Saturn and Venus this year in conjunction! What says the almanac to that?"

⁵⁸*Geoponica* 1.12.29. ⁵⁹*Geoponica* 1.12.37.

⁶⁰This work is to be found on pages 41-54 of the edition named in note 50, above.

⁶¹3.23.

⁶²3.37-39. ⁶³5.51-53. ⁶⁴3.159-161.

⁶⁵2.25; 3.33, 65, 68-69, 77, 79, 95, 105, 132, 134, 141, 156.

⁶⁶Ellen H. Bennett, *Astrology; Science of Knowledge and Reason*, 298-299 (New York, Published by the Author, 1897). See also the following unsigned articles: *Do the Planets Affect Our Weather?*, *Scientific American* 111 (1914), 42; *Planets and the Weather*, *ibidem*, 404.

⁶⁷In THE CLASSICAL WEEKLY 20.53-54 I have tabulated many references to this and other works.

⁶⁸Claudii Ptolemaei *Opera Quae Extant Omnia*, edited by J. L. Heiberg, 2.14-67 (Leipzig, Teubner, 1907). Ptolemy's work, with the Greek and a Latin translation in parallel columns, is to be found in Migne, *Patrologia Graeca*, 19.869-904, but the text there given is unreliable. An excellent composite calendar, made from several sources, including Ptolemy, is to be found in Daremberg et Saglio, *Dictionnaire des Antiquités Grecques et Romaines, under Calendarium*, 1.838-849.

⁶⁹This is the computation given in Heiberg, 2.66 (see note 68, above).

Thoth 1. The star in the tail of Leo arises at the hour fourteen and a half. Etesian winds, rains, and thunder cease.

Thoth 6. The bright star of austral Chelae is concealed at the hour fifteen and a half. There follow mist and heat, or rain or thunder; according to Eudoxus wind, thunder, and intemperate air follow.

Choiak 14. Capella sets at the hour fourteen and a half. Democritus lists it as bringing thundering, lightning flashes, rain, and wind.

Pharmouthi 19. At the hour fifteen the bright evening star of Lyra rises. For the Egyptians it heralds the wind Leuconotus, thunder, and drizzling rain.

Payni 10. At the hour fifteen and a half the star in the head of the rear figure of the Gemini disappears. There is thundering, with rain.

Epeiph 11. At the hour fourteen and a half the middle star of the belt of Orion appears. At the hour fifteen and a half the star in the forward shoulder of Orion is visible. Zephyr or Argestes blows, accompanied by thunder⁷⁰.

In a somewhat similar calendar, compiled for Migne's *Patrologia Graeca*⁷¹ from Ovid, *Fasti*, Columella, *De Re Rustica*, and Pliny (18.230-308), thunder is mentioned only once⁷², although thunder and lightning are doubtless taken for granted in connection with severe storms.

ASTROLOGICAL THUNDER CALENDARS

No weather lore of antiquity was more specialized or more complex than that of thunder and lightning, especially as it was formulated by astrologers, who made 'brontologies', thunder calendars, for the entire year. The keen interest which a rural population would have in such calendars is readily understandable, since, as we shall see, in times of scanty rainfall and drought people welcomed thunder as a forerunner of beneficent rain. In times of excessive rainfall thunder was feared as portending floods and destruction of crops.

A Roman, Nigidius Figulus, compiled a 'brontoscope', or lunar thunder calendar, in which he explained the significance of thunder for every day of the year⁷³. The calendar began in June, when the sun was in the moon's house, Cancer, and continued from the new moon by lunar months throughout the year⁷⁴. The interpretations of thunder are concerned with a variety of human interests, such as crops, cattle, pests, health, and matters of state, but for about one-fifth of the days Nigidius has something to say about the weather.

If it thunders on (lunar) June 3, there will be very dry heat that will burn fruit and crops; if it thunders on June 4, there will be rain and clouds, and the atmo-

sphere will be so heavy as to threaten to rot crops; if it thunders on June 8, there will be a deluge and destruction of crops; if it thunders on June 14, there will be an excess of heat.

Other weather predictions are made for June 17, 22, 26; July 3, 4, 7, 11, 12, 18, 20, 25, 28; August 6, 7, 23, 25; September 3, 9, 12, 15, 22, 23, 24, 29; October 3, 11, 15, 27; November 10, 11, 22, 23; December 4, 11, 21, 22; January 1, 10, 29; February 12, 15, 17, 18, 20, 22, 25, 28; March 5, 6, 7, 8, 11, 15, 16, 18, 19, 21; April 5, 8, 12, 23, 29; May 4, 10, 17, 22, 23, 30.

The greatest drawback to this calendar was the fact that one had to live in Rome to profit by it⁷⁵.

An Egyptian brontology compiled according to solar months has been preserved for us by Lydus⁷⁶. It tells what will happen if thunder occurs when the sun is entering or has entered the various signs of the zodiac. I give a digest of the portents, so far as they pertain to the weather.

If it thunders in January when the sun is going into Capricorn, there will be thick and foggy mist, so that the crops on the vines will fruit ahead of time and the wine will not be of good quality. If the misty weather continues till the rising of the Dog-Star, the year will be pestilential and without produce⁷⁷.

If it thunders in April when the sun is entering Aries and no rain ensues, certain countries will experience heat and drought, and plants will fail to produce crops⁷⁸.

If it thunders in July when the sun is in Cancer, there will be plenty of wine and a dry atmosphere⁷⁹.

According to a work on thunder compiled by Labeo⁸⁰, if a thunderbolt falls in a wood as Cancer is rising when the sun is in that sign, the hot season will be moderate, but there will be only a little precipitation⁸¹. A bolt that falls when the sun is in Pisces threatens a storm at sea⁸².

A brontoscope made by Fonteius⁸³ enumerates many things, chiefly ills, that will happen if it thunders by day or by night while the moon is in the various signs of the zodiac. There are several weather indications. If it thunders by night when the moon is in Capricorn, there will be severe tempests, shipwrecks, and dangerous squalls⁸⁴. If it thunders by day when the moon is in Pisces, there will be abundance of water both in rivers and in the sea, but the atmosphere will be foggy⁸⁵. Thunder by day with the moon in Taurus foreshadows a deluge of rain and hail, and overflowing of rivers. Thunder by night means that the weather during the spring will threaten rain and hail⁸⁶. Thunder by day with the moon in Cancer portends danger for those who sail the seas. If it thunders by night with the moon in Leo, great precipitation will injure the crops⁸⁷. With the moon in Virgo thunder by day is a harbinger of wet weather. When thunder occurs by night with the moon in Scorpio, men must pray that they shall not be blotted out by a downfall of thunderbolts. If it thunders by night with the moon in Sagit-

⁷⁰The special items which I have given one may find by consulting either of the first two works named in note 68, above. For other references to thunder and lightning see under Thoth 6, 7; Phaophi 19, Tybi 15, Phamenoth 28, Pachon 23, Payni 11, Mesore 29.

⁷¹19.913-926. This volume was edited by various scholars.
⁷²The single mention of thunder, under date of August 20, is as follows: Sol in Virginem transitum facit, hoc et sequenti die tempestatem significat, interdum et tonat. Eodem die Fidis occidit. The passage is taken from Columella, *De Re Rustica* 11.2.58.

⁷³Lydus 27-38. I am merely following Lydus in beginning with signs derived from thunder in June.

⁷⁴I am informed by an astronomer that he found a lunar calendar in use in Korea in 1907.

⁷⁵This is stated in Section 38, at the very end.

⁷⁶Lydus 23-26.

⁷⁷Lydus 23.

⁷⁸Lydus 24.

⁷⁹Lydus 25.

⁸⁰Lydus 47-53.

⁸¹Lydus 49 C.

⁸²Lydus 52 B.

⁸³Lydus 39-41.

⁸⁴Lydus 39.

⁸⁵*Ibidem*.

⁸⁶Lydus 40.

⁸⁷*Ibidem*.

tarius, there will be great precipitation, so that crops will thrive, but there will also be squalls and strong winds⁸⁸.

The first thunder in each year after the rising of the Dog-Star was very significant; it had many interpretations, dependent upon the 'home' of the zodiacal circle in which the moon happened to be. In general, it brought woe to prince and peasant. With the moon in Cancer the first thunder was a sign of much precipitation about March or April; with the moon in Virgo, the first thunder signified danger to those upon the sea; with the moon in Capricorn, the first thunder portended rain for fifty days⁸⁹.

There are several interesting astrological thunder calendars in *Catalogus Codicum Astrologorum Graecorum*⁹⁰. They give prophecies of many joys and woes that are to befall man, but thunder is sometimes an index of the kind of weather that is to follow.

One calendar tells what will happen if it thunders <when the moon⁹¹ is> in any of the signs of the zodiac during the entire year. If, for instance, it thunders <when the moon is> in Cancer, great winds will blow⁹².

Another calendar⁹³ lists the events indicated by thunder when either the sun or the moon is in various signs of the zodiac. Thunder when the moon is in Gemini in June means, according to Eudoxus, many storms and abundant produce; when the moon is in Cancer in July, thunder means lack of rain until the beginning of winter; after that time winds will blow and there will be showers. If it thunders while the moon is in Sagittarius in December, there will be a good season and a bountiful supply of nourishing rain. Thunder while the sun is in Cancer during July signifies dry air; if it thunders while the sun is in Capricorn in January, there will be thick mist, so that crops will wither unseasonably and wine will be without quality.

Other interesting omens derived from thunder at various times in the year may be found in R. C. Thompson's work on *The Reports of the Magicians and Astrologers of Nineveh and Babylon in the British Museum*⁹⁴:

No. 181. When it thunders in Iyyar, wheat and vegetables will not be prosperous.

No. 253. When it thunders on the day of the Moon's disappearance, the crops will prosper and the market will be steady.

No. 254. If Rammānu should thunder in the midst of the Sun, there will be mercy upon the land.

No. 256 b. When it thunders in Ab, the day is dark, the heaven rains (?) the crops of the land will prosper. When it thunders on a cloudless day, there will be famine. When lightning lightens on a cloudless day, Rammānu will inundate.

No. 257. When it thunders in Ab, the day is dark,

heaven rains, lightning lightens, waters will be poured forth in the channels. When it thunders on a cloudless day, there will be darkness (or) famine in the land.

No. 259. When it thunders in Tisri, the day is dark, heaven rains, the rainbow is divided, lightning lightens, the gods will have mercy on the land.

No. 261. When it thunders in Sebat, there will be an invasion of locusts. When it thunders in Sebat, heaven will rain with stones.

No. 262. When it thunders in Adar, the day is dark, heaven rains, lightning lightens, a great flood will come, and the crops (will prosper).

Other nations and other ages have been equally devoted to astrological meteorology. I quote from Marco Polo⁹⁵.

There are in the city of Kanbalu, among Christians, Saracens, and Cathaians, about five thousand astrologers and prognosticators, for whose food and clothing the grand khan provides in the same manner as he does for the poor families above mentioned, and who are in the constant exercise of their art. They have their astrolabes, upon which are described the planetary signs, the hours (at which they pass the meridians), and their several aspects for the whole year. The astrologers (or almanac-makers) of each distinct sect annually proceed to the examination of their respective tables, in order to ascertain from thence the course of the heavenly bodies, and their relative positions for every lunation. They discover therein what the state of the weather shall be, from the paths and configurations of the planets in the different signs, and thence foretell the peculiar phenomena of each month: that in such a month, for instance, there shall be thunder and storms; in another, earthquakes; in another, strokes of lightning and violent rains; in another, diseases, mortality, wars, discords, conspiracies. As they find the matter in their astrolabes, so they declare it will come to pass; adding, however, that God, according to his good pleasure, may do more or less than they have set down. They write their predictions for the year upon certain small squares, which are called *takuini*, and these they sell, for a groat apiece, to all persons who are desirous of peeping into futurity. Those whose predictions are found to be the more generally correct are esteemed the most perfect masters of their art, and are consequently the most honoured.

During the Middle Ages the prophet Daniel, who in Biblical times had been a great dream-seer, was looked upon as a weather forecaster:

... Works of divination were also attributed to Daniel in Syriac and Arabic, such as predictions of rain, hail, and the like for each day of the year, and of eclipses and earthquakes, or astrological forecasts for each month of the year⁹⁶.

By Shakespeare's time the stars had replaced thunder as means of predicting events for the year, weather included. A pertinent passage is to be found in *Sonnet 14*:

Not from the stars do I my judgement pluck;
And yet methinks I have astronomy,
But not to tell of good or evil luck,
Of plagues, of dearths, or seasons' quality:
Nor can I fortune to brief minutes tell,
'Pointing to each his thunder, rain, and wind,
Or say with princes if it shall go well,
By oft predict that I in heaven find. . . .⁹⁷

⁹⁵The Travels of Marco Polo the Venetian, Book II, Chapter 25 (= pages 217-218 in the Everyman's Library Edition [New York, Dutton, 1907]).

⁹⁶Lynn Thorndike, *A History of Magic and Experimental Science During the First Thirteen Centuries of Our Era*, 2.294 (New York, Macmillan, 1923). <For a review of this work see THE CLASSICAL WEEKLY 20.209-211. C. K.>.

⁹⁷For other evidences of weather calendars in Shakespeare see T. F. Thiselton-Dyer, *Folk-Lore of Shakespeare*, 474 (London, Griffin and Farran, 1884).

⁸⁸Lydus 41. ⁸⁹Geoponica 1.10.1, 5, 7, 11.

⁹⁰I have used material from this wonderful collection of texts in previous papers in THE CLASSICAL WEEKLY (see 22.30, 36; 24.25). See also *ibidem*, 20.47, notes 69, 72.

⁹¹When no heavenly body is mentioned in the 'brontologies', reference to the moon must, it seems, be taken for granted. A cautious remark to this effect is made in *Astrol. Graec.* 10.129.

⁹²*Astrol. Graec.* 4.128-131. See also 8, Part III, 168-171, 193-197.

⁹³*Astrol. Graec.* 7.163-167. See also 183-187; 10.129-132, 140-142. From the same work, 8, Part III, 181-187, we learn the significance of the moon in various signs of the zodiac and what will happen if thunder or earthquake occurs at such times.

⁹⁴See Volume 2 (London, Luzac and Company, 1900). See also F. Lenormant, *La Divination et la Science des Présages chez les Chaldéens*, 73-74 (Maisonneuve, Paris, 1875).

The influence of the old thunder calendars has not yet died. In Sweden to-day there are almanacs called *Sibyllae Prophetia*, in which prognostics for the weather and the fruitfulness of the entire year are drawn from the occurrence of thunder on the first days of the various months. "Und in der Tat liefert die assyriologische Literatur Beweise dafür, dass dieser Gewitteraberglaube chaldäische Ursprungs ist"⁹⁸.

The art of making general weather predictions for the entire year is still thriving in the United States also. I have in my possession a "New Weather Almanac and Hand Book of Useful Information for 1929". It prognosticated for April 9-13 "Thunder showers for Texas", for April 22-25 "Lightning and heavy thunder and rainfall locally at many points", for May 5-8 "Much lightning and thunder in southern and southwestern states", for May 18-22 "Heavy rains with destructive lightning storms and hail in Oklahoma, Kansas, Missouri, Kentucky and Ohio", and so on.

BOLTS FROM THE BLUE

For both Greeks and Romans lightning, thunder, and thunderbolts from a clear sky were significant⁹⁹. Lightning under such conditions is called a portent by *Bacchylides*¹⁰⁰. Thunder was similarly regarded by *Titus*, who was gloomier than usual at the end of a celebration of public games because the victim had fled as he was sacrificing, and because it had thundered in clear weather¹⁰¹.

As *Caesar* was approaching Rome in the Civil War, great fear was felt after *Pompey* had fled. To add to the general alarm, there were frequent flashes of lightning in a clear atmosphere. A silent bolt fell, though no clouds darkened the sky¹⁰².

Among the unlucky omens in connection with the conspiracy of *Catiline* were numerous thunderbolts falling from a clear sky¹⁰³, one of which killed *Marcus Herennius*, a decurion of *Pompeii*¹⁰⁴. In the time of *Alexander* and *Macrinus* a bolt on a clear day killed four priestly attendants of idols¹⁰⁵.

The least frightful of these portents have to do with the weather. When it thunders and lightens in a clear sky, there will be a storm; when it lightens on a clear night from the direction of *Auster* or *Corus* or *Favonius*, there will be wind and rain from those regions¹⁰⁶.

If, however, lightning and thunder occurred in a clear sky to the left of a Roman, it was a good portent. The weather was clear when lightning signified to

Ascanius that his encounter with *Remulus* would be successful¹⁰⁷. We read that thunderbolts from the left in a clear sky, whether seen or heard, were favorable¹⁰⁸.

Again, such portents coming in response to prayer indicated divine favor. In answer to an entreaty from *Odysseus* for a sign *Zeus* thundered from bright *Olympus*¹⁰⁹. To reassure *Numa*, *Zeus* thundered thrice in a clear sky, and sent three bolts¹¹⁰. When a bolt from a clear sky entered the home of *Antoninus Pius* without wreaking injury on anything, it was regarded as a remarkable dispensation¹¹¹.

Although *Aristotle*¹¹² asserts that lightning does not occur in a clear sky and that it is wanton to say that it does, there is evidence that this actually happens. In commenting on a report that a bolt had killed two children in *Indiana*, in July, 1926, when the nearest cloud seemed to the witnesses two and one-half or three miles away, a writer says, in a meteorological publication¹¹³:

The striking of lightning, through clear sky, at points somewhat distant from the region immediately beneath the storm, while relatively rare, occurs probably more frequently than is realized.

During a three-year residence in east-central Florida I observed the phenomenon at least three times. The typical local thunderstorm cloud of the Florida summer grows with great rapidity, and is usually an entity quite unconnected with storms of the same kind that may be developing elsewhere within the observer's field of view. Opportunities for watching the lightning strokes from individual clouds are therefore excellent.

*Anaximander*¹¹⁴ held that it does thunder in a clear sky. Though clouds are absent, the atmosphere may be shaken and rent by the air. Thunder occurs without lightning when the air is too rare and feeble to produce flame, but is still strong enough to produce sound.

According to our own lore, the reverse condition, lightning without thunder, means that there will be a continuance of fair weather¹¹⁵.

FREQUENCY OF THUNDERBOLTS IN VARIOUS COUNTRIES AND SEASONS

There were differences in the frequency with which thunderbolts fell in various countries and seasons, but the reports about such matters were exaggerated or falsified by ignorance or superstition. Their frequency in *Etruria* was ascribed to the thickness of the atmosphere¹¹⁶. An elaborate thunder-cult could hardly have arisen in a country where thunderbolts were not

⁹⁸Deutsche Rundschau 198 (1924), 52.

⁹⁹For other examples of lightning in clear weather see *Herodotus* 3.86; *Xenophon*, *Hellenica* 7.1.31; *Obsequens* 62 (123).—The text of *Obsequens* may be found in a volume edited by *Otto Jahn* (Leipzig, Breitkopf and Härtel, 1853), which contains the *Periochae* of *Livy*, and *Obsequens's Prodigiorum Liber*.

For thunder see *Herodotus* 3.86; *Horace*, *Carmina* 1.34.5-8; *Seneca* 1.1.13, *Thyestes* 263; *Obsequens* 24 (83), 47 (107); *Festus*, 285 (Lindsay); *Varro*, as quoted by *Nonius Marcellus* 587.14-15, 610.15-16, 656.5 (Lindsay).

For thunderbolts see *Vergil*, *Georgics* 1.487-488; *Suetonius*, *Augustus* 95 (compare *Obsequens* 68 [128]); *Servius* on *Vergil*, *Georgics* 1.487; *Obsequens* 1 (55); 28 (120); *Lydus* 45. See also *Plutarch*, *Lucullus* 8.6.

¹⁰⁰16, 72-73. ¹⁰¹*Suetonius*, *Titus* 10.1. ¹⁰²*Lucan* 1.522-535.

¹⁰³*Dio* 37.25.2. ¹⁰⁴*Pliny* 2.137. See also *Obsequens* 61 (122); *Cicero*, *De Divinatione* 1.18, and *A. S. Pease*, *M. Tulli Ciceronis De Divinatione*, pages 108-109 (*Obsequens* 1 (University of Illinois Studies in Language and Literature, VI, VIII [1920, 1923])).

¹⁰⁵*Acta Martyrii S. Callisti*, I (Migne, *Patrologia Graeca*, 10, 113-114).

¹⁰⁶*Pliny* 18.354.

¹⁰⁷*Dionysius* 2.5; *Vergil*, *Aeneid* 9.630-631. Compare *Ennius*, as quoted by *Cicero*, *De Divinatione* 2.82; *Vergil*, *Aeneid* 2.693.

¹⁰⁸*Servius* on *Aeneid* 2.693.

¹⁰⁹*Odyssey* 20.112-114. Compare *Vergil*, *Aeneid* 8.520-531.

¹¹⁰*Ovid*, *Fasti* 3.369 *Ter tonit sine nube deus, tria fulgura misit. Compare Vergil*, *Aeneid* 7.141-142 *Hic pater omnipotens ter caelo clarus ab alto intonuit*; *Statius*, *Thebais* 5.86-87 *quater axe sereno intonuit*; *De Ecclesia* 44-45, in *Anthologia Latina*, 1.46 (edited by *A. Riese*, Leipzig, Teubner, 1869, 1870), *graviter commotus <omnipotens genitor> et alto dat clarum e caelo signum*.

¹¹¹*Capitolinus*, *Antoninus Pius* 3.5.

¹¹²*Meteorologica* 2.9, 369 b. See also *Lucretius* 6.247-248; *Isidorus*, *De Natura Rerum* 30.2.

¹¹³*B. M. V<arney>*, A Lightning Stroke Far from the Thunderstorm Cloud, *Monthly Weather Review* 54.344 (August, 1926). See also *Lightning Out of a Clear Sky*, *ibidem*, 466 (November, 1926); *Russel M. Geer*, *Horace*, *Odes* 1.34, *The Classical Journal* 21 (1926), 628; *Russel M. Geer*, *Horace*, *Carmina* 1.34.5-8, *THE CLASSICAL WEEKLY* 22 (1928), 24.

¹¹⁴*Anaximander's theories* are recorded by *Seneca* 2.18. ¹¹⁵*D.* 80. ¹¹⁶*Cicero*, *De Divinatione* 1.93.

very common. In Italy in general the great numbers of thunderbolts were attributed to the temperate climate¹¹⁷, especially in Campania¹¹⁸. They fell often along the shores of the Adriatic Gulf¹¹⁹. Acrocerania ('Thunder Point') was peculiarly exposed to them, as the name implies¹²⁰.

The varying temperature of spring and fall was supposed to be favorable to thunderbolts, since it fostered movement in the air and since at those times the atmosphere was neither too cold nor too warm¹²¹. In winter and in summer there was an excess of cold or heat¹²². Thunderstorms were especially common in Italy because the climate was 'always in a way vernal or autumnal'¹²³.

It was at the return of spring that Vulcan started the forges of the Cyclopes to prepare a supply of bolts for Jupiter¹²⁴. According to Servius¹²⁵, thunderbolts were extremely common in Greece at the vernal equinox. Seneca¹²⁶, however, says that bolts are more common in summer, because fire naturally starts more readily when the friction is in warmer air. Bolts were less frequent by night than by day¹²⁷.

As there were countries peculiarly subject to bolts, so there were lands that had a reputation for being more or less free from them. It was said that in India there were no thunderbolts, no lightnings, no rains¹²⁸. In Scythia, because of the cold, and in Egypt, because of the heat, thunderbolts were supposed not to occur, or, if they did, were regarded as omens of good¹²⁹. A scholiast¹³⁰ tells us that there were no bolts in Egypt except in winter. Herodotus¹³¹ says that thunder did not occur in Scythia in the season when it occurred elsewhere¹³²; he explains that in summer thunder was common and in winter so unusual as to be a portent. In the cold season in Scythia the clouds were so thick and gross, according to Diodorus¹³³, that there was neither thunder nor lightning.

We are told that in countries which are subject to snow and cold, as well as in those burned by the heat, such as Gaul and Egypt, the descent of bolts caused

¹¹⁷Pliny 2.136; Lydus 43. ¹¹⁸Pliny 2.136.

¹¹⁹Periegesis 380-386. This work is attributed to Scymnus Chius.

¹²⁰Compare Macaulay, Virginia 555-556: And the great Thundercape has donned His veil of inky gloom; Byron, Childe Harold 4.73: And in Chimari heard the thunder hills of fear Th' Acroceranian mountains of old name.—America has a Thunder Cape: it juts down from the Province of Ontario into Lake Superior, above Isle Royale.

¹²¹Pliny 2.135-136, 195; Plutarch, Moralia 912 F-913 A; Lucretius 6.357-361 (compare 5.675-676); Arrian in Stobaeus, Eclogae Physicae 1.29 (see the Wachsmuth-Hense edition of Arrian, 1.238 [Berlin, Weidmann, 1884-1912]); Psellus, De Omnifaria Doctrina, 137 (Patrologia Graeca, 122.769); Prognosticorum Reliquiae 3.63-65, 140-141 (pages 48, 52 in the edition named in note 50, above).

¹²²Pliny (2.135) says that in winter the air is too much condensed by the layer of heavier clouds and that the exhalation of the land, being chilled, crushes out whatever fiery elements it receives; in summer the heat cannot condense into clouds.

¹²³Pliny 2.136. ¹²⁴Horace, Carmina 1.47-8.

¹²⁵On Aeneid 11.259. At the vernal equinox the *manubiae* of Minerva stirred up great storms.

¹²⁶2.57.2. Compare Epicurus as quoted by Lydus 21, and Periegesis 385 (see note 119, above).

¹²⁷Pliny 2.138.

¹²⁸Ctesias, in Photius, Bibliotheca 46 a (in the edition by I. Bekker [Berlin, G. Reimer, 1824]).

¹²⁹Lydus 43, 52; Pliny 2.135. Compare Plutarch, Moralia 165 D. Philo-Iudaeus, De Vita Mosi 1.20.118-119, is especially interesting.

¹³⁰On Aratus, Phaenomena 924. Compare Horapollo, Hieroglyphica 1.29. A friend who wrote to me from Cairo under date of November 4, 1924 said that he had just seen a lightning storm in Cairo and that there had recently been much lightning in the Fayum.

¹³¹Herodotus 4.28. ¹³²I. e. in the spring and in the fall.

¹³³3.34.2.

astonishment¹³⁴. Gregory of Tours¹³⁵ mentions heavy thunder in autumn as among the remarkable things of one of the years of the reign of Childeric.

As Poseidon, the earthquake god, made the eastern part of Greece the scene of frequent disturbances, so the activities of Zeus were more manifest in the western part of that country¹³⁶. Modern observations of the weather of Greece have shown that it was not by mere chance that a seat of Zeus was established at Dodona¹³⁷.

THE THUNDERBOLT AND HIGH PLACES

Certain countries were supposed to be especially subject to bolts, but it became proverbial that mountain tops, peaks, and hills were often struck¹³⁸. The striking of peaks was explained by the theory that objects falling from heaven to earth descended by way of the clouds that gathered about mountains¹³⁹. This idea is found in Plutarch's description of the battle of the Crimesus¹⁴⁰. He says that fearful peals of thunder crashed down from the hills and that vivid flashes of lightning darted forth from them.

Sir William Ramsay notes¹⁴¹ the great prevalence of thunderbolts in the hills of Phrygia, a fact which no doubt accounts for the ardor with which Zeus of the Thunder was worshipped in that region.

The appearance of lightning above peaks near Athens served as a weather index under certain conditions¹⁴².

... If at the setting of the Pleiad there is lightning over Parnes Brilessus and Hymettus—when it appears over all three mountains, it indicates a great storm; when over the two lesser heights, a less violent storm; when over Parnes alone, fine weather....

Barren places and the sea were likewise often struck¹⁴³. Cicero says¹⁴⁴ that, if Jupiter signified anything by bolts, he would not send so many of them to no purpose. What does it profit him when they fall into the midst of the sea or upon the loftiest mountains?

In spite of the traditional fondness of bolts for high places, some peaks were supposed to be too high to be exposed to bolts or even to wind. Isidorus¹⁴⁵ gives Olympus as an example. St. Augustine¹⁴⁶ explains that because of its height clouds cannot gather there and that the air above it is not thick enough for winds and rains and clouds to form.

Lower regions might, however, be exempt from visitation by the elements. There was a wood near

¹³⁴Arrian, as quoted by Stobaeus, Eclogae Physicae 1.29 (in the edition named in note 121, above).

¹³⁵Historia Francorum 10.23 (Migne, Patrologia Latina, 71.554). Plutarch (Moralia 165 D) says that earthquakes were not feared by the man who lived in Gaul.

¹³⁶Mommsen, Delphica 3 (Leipzig, Teubner, 1878).

¹³⁷*Ibidem*, 4-5: "Janina (Dodona) stellt mit 49 Donnertagen jährlich das absolute Maximum der europäischen Gewitter dar. Im Juni 1809 hat es bei Janina an 23 Tagen gedonnert und geblitzt". It has been suggested (*ibidem*, 6, note 1) that the name Δωδώνη or Δωδών resembles the rumble of thunder.

¹³⁸Cicero, De Divinatione 2.45; Lucretius 5.1127-1128, 6.306, 421-422; Horace, Carmina 2.10.11-12; Vergil, Georgics 1.331-333; Ovid, Remedia Amoris 370; Lucan 7.449; Seneca 2.58.3, Epistulae 19.9, Agamemnon 96, Phaedra 1134-1135. See also Otto, Die Sprichwörter und Sprichwörtlichen Redensarten der Römer, 148 (Leipzig, Teubner, 1890).

¹³⁹Seneca 2.58.3. ¹⁴⁰Timoleon 28.1.

¹⁴¹Journal of Hellenic Studies 3 (1882), 123-124, 5 (1884), 258. Seneca, Phaedra 1134-1136, recorded the fondness of Zeus for striking *Caucasus ingens Phrygiumque nemus matris Cybeles*.

¹⁴²Th. 43. ¹⁴³Cicero, De Divinatione 2.45.

¹⁴⁴*Ibidem*, 2.44. ¹⁴⁵De Natura Rerum 30.5.

¹⁴⁶De Civitate Dei 15.27.

Massilia where no tempest fell and no lightning flashed¹⁴⁷. Lightning might even be temporarily diverted from a place, as we may see from a passage in the works of Gregory of Tours¹⁴⁸. As he was riding on horseback from Burgundia to Tours, there came up a terrible storm; the heavens flashed with lightning and resounded with heavy thunder. Taking from his bosom some blessed relics which he had inherited from his father, he raised them toward the clouds, which forthwith parted and passed by to right and to left.

A MODERN THUNDER CALENDAR FOR SEASONS AND MONTHS

At present folklore pays but slight attention to the relative frequency of thunderstorms in various places, but an imposing (non-astrological) thunder calendar for seasons and months could be made by combining items from European and American sources¹⁴⁹. It is worth while to quote a few examples, especially since some of them repeat the hoary association of thunder with fertility and crops.

The thunder-storms of the season will come from the direction of the first thunder-storm.

With the first thunder the gods of rain open their petals. (Zuñi).

Early thunder early spring.

Thunder and lightning early in winter or late in fall indicates <sic> warm weather.

First thunder in winter or spring indicates rain and very cold weather¹⁵⁰.

A winter's thunder Is a summer's wonder¹⁵¹.

When thunder is heard in winter, it indicates cold weather¹⁵².

The number of times it thunders in January indicates the number of frosts there will be in April¹⁵³.

Si pour la première fois de l'année il tonne vers midi, l'été sera riche en orages. (Russie)¹⁵⁴.

Tonnerre en janvier, récolte en quantité¹⁵⁵.

Donner im Januar bedeutet grosse Kälte¹⁵⁶.

Février qui gèle et tonne annonce un bel automne¹⁵⁷.

If it thunders in February, there will be snow in May¹⁵⁸.

If it thunders on a certain day in February, there will be frost on that day in May¹⁵⁹.

The number of times it thunders in February, so often will it frost <sic> in May¹⁶⁰.

If it thunders on the last day of February, there will be frost on the last day of May¹⁶¹.

Thunder and lightning in February or March, poor sugar (maple) year¹⁶².

Thunder in March betokens a fruitful year¹⁶³.

The first thunder in spring means that winter is broken¹⁶⁴.

First thunder in the spring—if in the south it indicates a wet season, if in the north it indicates a dry season¹⁶⁵.

If there be sheet lightning with a clear sky on spring, summer, and autumn evenings, expect heavy rains¹⁶⁶.

If there be showery weather, with sunshine and increase of heat in the spring, a thunder-storm may be expected every day, or at least every other day¹⁶⁷.

Lightning in spring indicates a good fruit year¹⁶⁸. If it thunders on All Fools' Day, it brings good crops of corn and hay¹⁶⁹.

If there is much thunder in May, the months of September and August will be without it¹⁷⁰.

A thunderous May thunders the summer away¹⁷¹.

Lightning in summer indicates good healthy weather¹⁷².

If it thunders much at the beginning of September, much grain will be raised the following year¹⁷³.

Thunder-storms in September mean plenty of snow in February and March, and a large crop of grape wine¹⁷⁴.

Si tonnerre à septembre est cortège, décembre est bien fourni de neige et l'an prochain sera de ceux que Dieu protège¹⁷⁵.

Thunder and lightning on the northern lakes in November is an indication that the lakes will remain open until the middle of December or until Christmas¹⁷⁶.

Wenn es im Christmonat donnert, so hat da Jahr viel Wind¹⁷⁷.

Thunder during Christmas week indicates that there will be much snow during the winter¹⁷⁸.

THUNDER AND ANIMAL LIFE

Of all the members of the animal kingdom that have fabled associations with thunder and lightning none is mentioned more frequently in 'brontology' than the eagle. It was the only bird, men said, that was never struck by lightning; for this reason it was selected as the weapon-bearer of Zeus¹⁷⁹. Apparently Zeus's supply of bolts was not inexhaustible, for one of this bird's duties was the carrying back of spent missiles to Zeus¹⁸⁰. Representations of the eagle clasping bolts in its talons are to be seen on many Greek and Roman coins and vases.

At Olympia there were statues of Zeus with an eagle in one hand and a bolt in the other¹⁸¹. The eagle surmounts many a scepter pictured on ancient monuments and other objects.

Early Greek kings, especially such as could claim descent from Aiolos, were held to be embodiments of the sky-god Zeus, and as weather-makers for the community bore a sceptre tipped with the lightning-bird¹⁸². . . . There can be little doubt that the winged thunder-bolt, repeatedly mentioned or implied in Attic poetry, was originally modelled on the eagle, the recognised lightning-bird of the Greeks. Aischylos in an extant fragment of his *Niobe* makes Zeus himself declare:

'Yea, Amphion's house

Will I burn down with eagles bearing fire.'

And H. Usener rightly insisted that the phrase attests a

¹⁴⁷D. 81-82.

¹⁴⁸D. 81.

¹⁴⁹T. F. Thiselton-Dyer, *English Folk-Lore*, 255 (London, D. Bogue, 1880).

¹⁵⁰D. 81.

¹⁵¹The Spectator 89 (1902), 983.

¹⁵²D. 82.

¹⁵³D. 81.

¹⁵⁴German lore, as quoted by D. 81.

¹⁵⁵Schweizerisches Archiv 26 (1926), 7.

¹⁵⁶D. 81. ¹⁵⁷Schweizerisches Archiv 26 (1926), 90.

¹⁵⁸Kansas lore, as quoted by D. 79.

¹⁵⁹Pliny 10.15; Lydus 45. See also Vergil, *Aeneid* 5.255; Horace, *Carmina* 4.4.1; Ovid, *Metamorphoses* 10.157-158; Pliny 2.146; Silius Italicus 12.58; Statius, *Thebais* 3.506-507; Manilius, *Astronomicon* 1.344-346. Dionysius, *De Avibus* 1.3, attributes the selection of the eagle to its surpassing all other birds in strength, but this seems to be the explanation of a cloistered scholar.

¹⁶⁰Manilius, *Astronomicon* 5.490, 501.

¹⁶¹Pausanias 5.22.5, 7. ¹⁶²Cook 2.1159; 2.1132-1134: "The sceptre originally belonged to the king as weather-maker, and the eagle on it was no mere decoration, but an actual embodiment of Zeus, which conferred upon its holder the powers of the sky-god".

¹⁴⁷Lucan 3.408-410. ¹⁴⁸De Gloria Martyrum 1.84 (Migne, *Patrologia Latina*, 71. 780). See also De Miraculis Sancti Iuliani 27 (*ibidem*, 817).

¹⁴⁹A fertile source for such European material is R.-O. Frick, *Le Peuple et la Prévision du Temps*, Schweizerisches Archiv 26 (1926), 1-21, 89-100, 171-188, 254-279. A monumental collection of such lore has been made by Alexis Yermoloff, *Der Landwirtschaftliche Volkskalender* (Leipzig, Brockhaus, 1905). This work contains 567 quarto pages.

¹⁵⁰The last five items are from D. 80.

¹⁵¹D. 82.

¹⁵²D. 82. See also Thomas 2404. ¹⁵³Thomas 2407.

¹⁵⁴Schweizerisches Archiv 26 (1926), 14. ¹⁵⁵*ibidem*, 10.

¹⁵⁶*ibidem*, 92. ¹⁵⁷*ibidem*, 9. ¹⁵⁸Thomas 2409.

¹⁵⁹Thomas 2410. ¹⁶⁰Thomas 2411.

¹⁶¹Thomas 2412. ¹⁶²D. 80. ¹⁶³D. 81.

¹⁶⁴Thomas 2394. ¹⁶⁵D. 82. ¹⁶⁶D. 82.

long-standing popular belief. Those who regarded the eagle as the natural bringer of the lightning would of course take the wings of the thunderbolt to be eagle's pinions¹⁸³.

Since the eagle was not struck by lightning, it was almost inevitable that the ancients would endow it with the power of protecting things on which it perched. Modern scholarship now argues that the representations of eagles which the Greeks placed upon the pediments of some of their early temples¹⁸⁴ served as substitutes for lightning-rods¹⁸⁵. A similar use was made of the *lynx*¹⁸⁶. We know, too, that the Etruscan Tages used the head of an ass to protect fields from evils in general, including thunderbolts¹⁸⁷. In a previous paper I gave several examples of the use of animals or parts of animals to avert thunder and thunderbolts¹⁸⁸. Of course, animals served as sacrifices to propitiate thunder and lightning¹⁸⁹.

The eagle was not the only minister of Zeus. Pegasus was said to dwell in the halls of wise Zeus and to bring him the thunder and the lightning¹⁹⁰. Euripides's Bellerophon¹⁹¹ pictures him as drawing the thunder-car. In a parody of this tradition Aristophanes¹⁹² hitches a beetle to the thunder-chariot. The bolt is sometimes represented on coins beneath the figure of Pegasus¹⁹³.

The two horses of the sun-chariot are called Bronte, 'Thunder', and Sterope, 'Lightning'¹⁹⁴. Pindar represents thunder as a horse driven by Zeus¹⁹⁵; Bacchylides represents it, perhaps, as an eagle¹⁹⁶.

Another bird which has had a long meteorological career, as might be inferred from representations of it on weather vanes, is the woodpecker. Of some of its activities J. R. Harris says¹⁹⁷:

These rain-making functions are of the highest importance in the study of the Woodpecker-cult; for they descend from a time when the Woodpecker was the Thunder-bird, and are to be studied in the light of the bird's ancestry.

It is pertinent to this paper to list a few of the effects of thunder upon animal life. For example, the *silurus*, a river fish, is always put to sleep by thunder except at the time of the rising of the Dog-Star¹⁹⁸. In modern

lore, thunder is not a lullaby. Contrast Shakespeare's "...thunder shall not so awake the beds of eels..."¹⁹⁹, and also the still current superstition, "The first thunder in the spring awakens the snakes"²⁰⁰.

If it lightens, shell-fish close, and their pearls are dwarfed according to the extent of the hunger of the fish. If it thunders, too, then they are frightened, and, closing their shells, produce what are known as *physemata*, or empty pearls, which are filled with air. These are abortions of shell-fish²⁰¹. The mollusk is aided, however, in producing pearls by continued thundering and heavy downpours of rain, and under such conditions its pearls are of the finest size and quality²⁰².

The noise of thunder frightens sheep and causes abortion if they are left alone; for this reason they are kept together in flocks, where they are less timid²⁰³. The Egyptians, however, say that Apis was conceived when lightning fell upon a cow²⁰⁴.

In the thunder calendar preserved by Lydus²⁰⁵ it is stated that thunder on a number of days results in the generation of insects and small animals. On June 6 it causes the birth of a destructive insect in mature fruits, on November 16 of locusts and mice, on December 17 of small locusts. There are many other omens of the same general nature²⁰⁶, but it is clear that they originated in a land where mice and locusts were serious pests.

To-day we hear of rains of animals, but we know that we see great numbers of some kinds simply because storms caused them to leave their retreats. The name 'thunderworm' is applied to a wormlike limbless lizard "because it leaves its burrows after a thundershower"²⁰⁷. It is worth while to quote in this connection a curious piece of lore which I found in a newspaper²⁰⁸:

It <= the woodcock> knows very well that rain beating on the soil will cause worms to move toward the surface. Indians and some old hunters say that the woodcock has a trick of vibrating its wings close to the ground so as to imitate the sound of falling rain and thus it lures worms which have burrowed deep in the ground to a place within reach of its long beak.

(To be continued)

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¹⁸³Cook 2.777, 779.

¹⁸⁴See Pindar, *Olympica* 13.21-22.

¹⁸⁵Salomon Reinach, *Aetos Promêtheus*, *Revue Archéologique*, Quatrième Série, 10 (1907), 59-81. See also the same writer's work, *Cultes, Mythes, et Religions*, 3.68-73 (Paris, E. Leroux, 1908).

¹⁸⁶See Cook 1.256-265.

¹⁸⁷Columella 10.344-347. The connection seems to make it clear that thunderbolts are included among the evils.

¹⁸⁸THE CLASSICAL WEEKLY 16.6-7.

¹⁸⁹See THE CLASSICAL WEEKLY 18.155. In modern lore birds with parts of their bodies colored red or with sharp beaks are endowed with the power of averting lightning. See *Handwörterbuch des Deutschen Aberglaubens*, under *Blitz*, 1.1412-1413.

¹⁹⁰Hesiod, *Theogonia* 285.

¹⁹¹*Fragmenta* 312 (in A. Nauck, *Tragicorum Graecorum Fragmenta* 2 [Leipzig, Teubner, 1889]).

¹⁹²Pax 720-722. Compare 42.

¹⁹³See, for example, *A Catalogue of Greek Coins* [in the British Museum], *Corinth, Colonies of Corinth*, . . . , page 95, Nos. 9, 10, 14. See also E. S. McCartney, *The Symbolism of Pegasus on Aera Signata*, *American Journal of Archaeology* 28 (1924), 66.

¹⁹⁴Hyginus, *Fabulae*, 183.

¹⁹⁵*Olympica* 4.1, and scholium ad locum. ¹⁹⁶5.19-20.

¹⁹⁷Picus Who is also Zeus, 41-42 (Cambridge: At the University Press, 1916). For other storm birds see Fiedler 29-31.

¹⁹⁸Pliny 9.58.

¹⁹⁹Pericles 4.2.154-155. My boyhood friends and I made a practice of fishing for eels after storms because we knew that they would be swimming about in search of the worms and other things which the storms washed into the creeks. The effect of thunder and lightning on fishing is discussed by F. G. Afalo, *Fishermen's Weather*, 207-227 (London, A. and C. Black, 1906).

²⁰⁰Thomas 2395.

²⁰¹Pliny 9.108. Compare Ammianus Marcellinus 23.6.86; Solinus 53.25; Origen, *Commentarius in Matthaeum* 13.45 (Migne, *Patrologia Graeca*, 13.851).

²⁰²Athenaeus 93 E. See Tzetzes, *Chiliades* 11.460-462; Aelian, *De Natura Animalium* 10.13; Theophylactus in *Matthaeum* 13.45-46.

²⁰³Pliny 8.188. Compare Plutarch, *Moralia* 666 C.

²⁰⁴Herodotus 3.28. The Greek words *σέλας* . . . *ἐκ τοῦ οὐρανοῦ* evidently mean lightning.

²⁰⁵De Ostentis 27.

²⁰⁶See also the items under the following dates: December 28; January 14, 22; February 15, 19; March 9, 11, 13, 14, 15, 18, 28; April 16; May 10.

²⁰⁷Webster's New International Dictionary of the English Language (1930), under *Thunderworm*.

²⁰⁸The Detroit News, March 15, 1931. I have been told that the sounds made by the wings of certain birds cause even the Indians themselves to regard them as thunder birds.



Classical Weather Lore of Thunder and Lightning (Continued)

Author(s): Eugene S. McCartney

Source: *The Classical Weekly*, Vol. 25, No. 24 (May 2, 1932), pp. 200-208

Published by: [Classical Association of the Atlantic States](#)

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largely responsible for the additional bulk. Some portions have been to a great extent rewritten; thus the treatment of the toga (161-166, old, 179-185, new) has been revised completely in the light of Miss Wilson's recent and illuminating study². There are to be discerned various other small, but not unimportant, corrections and alterations introduced from the full-flowing source of archaeological research. Furthermore, the text itself—the punctuation, phrasing, etc.—has been carefully scrutinized, and where necessary altered to conform more closely to the standards of taste current at the present day. In illustration of this, I may quote the opening sentence of § 114, first from the old, then from the new, edition:

In these Grammar Schools, Greek as well as Latin, great stress seems to have been laid upon elocution, a thing less surprising when we consider the importance of oratory under the Republic. . . .

In the Grammar Schools, both Greek and Latin, great stress seems to have been laid upon elocution, a fact not surprising when we consider the importance of oratory under the Republic. . . .

Generally speaking, one may recognize a real improvement in these minor alterations of the original diction. Occasionally, whole sentences are transposed or are transferred from one part of a paragraph to another.

Divers additions are made to the original work. We find the chapters of the two editions running hand in hand through Chapter XI. Then two intercalary chapters, XII. Farming and Country Life (353-366), and XIII. Town Life (367-374), make their appearance. They are followed by the twelfth (and closing) chapter of the first edition. Miss Johnston adds, finally, chapters on The Roman Religion (395-404: a strange lack in the earlier work) and The Water Supply of Rome (405-407).

From the point of view of the statistician, the following observations may be made. The number of pages is increased from 344 to 430—an increase of 25%. The number of paragraphs is increased from 438 to 502—an increase of 15%. The number of illustrations is increased from 205 to 327—an increase of 60%.

In addition, we now find two identical intra-cover charts of ancient Rome, and two colored maps, one of Italy, one of the Roman Empire—all extremely welcome supplements.

The new illustrations, and most of the old that have been reproduced, bear improved sub-titles. Thus, Figure 34 of the first edition, a rough drawing, was thus described: "Coin, Showing the Pilleus". The same illustration in the new edition (Fig. 72) appears as a good photograph of an impression of a coin of similar type with the following words subscribed: "Pilleus. On coin of 42 B. C., now in the British Museum, London". This sort of thing is destined to be of much service to the intelligent student.

The set of references to secondary sources formerly preceding the text of each chapter is augmented and revised. More of the older authorities might well

have been weeded out. But the list has been brought up to date by the inclusion of very recent works, even to the work entitled *Rome and the Romans*, by Professor Showerman³, published in the autumn of 1931.

As a final addition may be noted a good bibliography (409-412) which includes all works, most of which are specialized studies⁴, mentioned in the book.

One may without hesitation describe this new edition of *The Private Life of the Romans* as a sound and scholarly revision of a very good book.

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CLASSICAL WEATHER LORE OF THUNDER AND LIGHTNING

(Continued from page 192)

According to the ancients, no animal is burned by a bolt without being rendered lifeless by it. The parts struck are colder than the rest of the body²⁰⁹. In the dead bodies of poisonous animals worms do not generate, but, if they are struck by lightning, maggots appear in their bodies in a few days, since lightning consumes the poison²¹⁰.

We are told by Aristotle²¹¹ that thunder during incubation addles eggs. We, too, say that thunder and lightning addle eggs²¹² and we have other beliefs that are similar.

If it thunders in February goose eggs will not hatch²¹³.

If it thunders while ducks are sitting, the eggs will not hatch²¹⁴.

If it thunders heavily while a hen is sitting, it will kill the chickens²¹⁵.

In antiquity many things were placed in hatching straw to prevent eggs from being spoiled. Pliny²¹⁶ mentions iron nails and earth from a plow; Columella²¹⁷ recommends iron nails, heads of garlic, and branches of laurel. A modern prescription is as follows: "Cross two nails in the nest of a goose and thunder can not spoil the eggs"²¹⁸.

Some animal weather seers are specialists in recognizing the approach of thunderstorms. There is a thunder-snake "marked similarly to a rattlesnake, which . . . is supposed to foretell thunderstorms"²¹⁹. The thunderfish is "a European loach which burrows in the mud at the bottom of streams and ponds and is supposed to foretell the occurrence of thunderstorms by swimming about in the water"²²⁰.

³Grant Showerman, *Rome and the Romans*, A Survey and Interpretation (New York, The Macmillan Company, 1931). <This work is reviewed above, in this issue of THE CLASSICAL WEEKLY. C. K.>

⁴Quite properly, William West Mooney's book, *Travel Among the Ancient Romans* (Boston, Richard G. Badger, 1920), is not so much as mentioned. But it is not so easy to understand the omission of Amedeo Maiuri's work, *Pompeii* (Novara, Istituto Geografico de Agostini, 1929), a sumptuous and at the same time popular work.

²⁰⁹Pliny 2.145. ²¹⁰Seneca 2.31.2.

²¹¹De Animalibus Historia 6.2.560 a. ²¹²Thomas 1799.

²¹³Thomas 2413. Compare Journal of American Folklore 4 (1891), 121: "If it thunders on Sunday, goose eggs will not hatch".

²¹⁴Thomas 2698. See also 2689-2693. ²¹⁵Thomas 2697.

²¹⁶Pliny 10.152.

²¹⁷Columella 8.5.12. See THE CLASSICAL WEEKLY 18.163, first column.

²¹⁸Lyle Saxon, *Old Louisiana*, 346 (New York, The Century Company, 1929).

²¹⁹Fanny D. Bergen, *Animal and Plant Lore* (Memoirs of the American Folk-Lore Society, 7 [1899], 62, No. 702).

²²⁰Webster's New International Dictionary of the English Language (1930), under Thunderfish.

²Lillian M. Wilson, *The Roman Toga* (Baltimore, The Johns Hopkins Press, 1924).

THUNDER AND VEGETATION

Examples of the way in which some forms of plant life exercise protective powers against thunder and lightning were given in THE CLASSICAL WEEKLY 17. 108²²¹, but popular ideas about the influence of thunder and bolts upon vegetation are not less interesting.

Popular lore regarded thunder as both a generative and a fertilizing agency. So strong was this feeling that truffles, which were said to grow after thunderstorms, were called *κεραύνια*²²². Theophrastus, as quoted by Athenaeus²²³, says that mushrooms grow when fall rains and terrible thunderings occur, especially when there are thunderings, which are the more immediate cause of their growing.

In the *Moralia*²²⁴ of Plutarch there is a long inquiry into the reason why mushrooms are thought to be produced by thunder. It is regarded as probable that, when lightning and thundershowers descend forcibly with a great deal of warmth and spirit into the caverns of the earth, the ground is moved thereby, and knobs and tumors are formed like the wens or the kernels produced in our bodies by heat and noxious humors²²⁵.

Some advanced the explanation that thunder split the earth by using the air as a wedge, and that the crevices thus made directed mushroom pickers where to look for mushrooms. From this belief grew the idea that thunder engendered mushrooms²²⁶. It was believed, too, that mushrooms had some antithetical powers that saved them from being blasted by thunder²²⁷.

Ancient husbandmen thought that vegetation was especially fertilized by thundershowers²²⁸, a belief which has a modern counterpart in the saying that beans shoot up quickly after thunderstorms²²⁹. One theorist, named Agemachus, argues that waters which fell with the bolts became generative from the heat commingled with them, since they were rendered mild and gentle and fit to enter the pores of plants, where they were assimilated²³⁰.

Not far from the Academy at Athens there was an altar to Zeus Kataibates, who was called Morios also, from the *moriae* that grew there²³¹. The reference is to the olives propagated from the sacred grove on the Acropolis. According to Miss Jane Harrison²³², the identification of Zeus and Morios indicates a belief that Zeus, the god of thunder and rain, fertilized the earth and brought forth the sacred olives. Arnobius²³³

explains that the pagan story of the union of Jupiter and Ceres is an allegory in which Jupiter is the nourishing rain and Ceres the earth. This is a very easy explanation for a Christian to make, as may be seen from the words of Jeremiah, quoted near the beginning of this paper: "When he uttereth his voice there is a multitude of waters in the heavens..." Vergil²³⁴ would have agreed with this idea, for he says that, when Jupiter strikes Athos or Rhodope or lofty Ceraunia, ingeminant Austri et densissimus imber.

The reason for the association of thunder with the growth of vegetation is quite obvious. Rain and thunder frequently come together. Long droughts, which call attention to the need of rain, are often broken up by thunderstorms. Jupiter in his capacity as Tonans had to be appeased by the sacrifice of a stranger in order to end a nine-year drought in Egypt²³⁵. Weather-makers of antiquity who wished to bring rain not infrequently imitated thunder and lightning²³⁶.

The following description, by G. Macdonald²³⁷, of a Greek coin is pertinent in this connection:

In the center of the field of the coin... is a rock, on which sits *Zeus Térios* (Jupiter Pluvius) enthroned. He holds a thunderbolt in his left hand, while from his right a shower of rain descends upon the head of the recumbent divinity of the mountain.

We find a still longer weather sequence in a Cretan distich, according to which God gathers the clouds, thunders, and rains²³⁸.

Another deity who was regarded by some of the ancients as the cause of rain is Rhea. It was doubtless because rain was so often accompanied by thunder and lightning that she was represented as rejoicing in drums, cymbals, horn-blowing, and torch-carrying²³⁹. These things were evidently mimetic of thunder and lightning.

As Miss Harrison shows in her book, *Themis*²⁴⁰, there were many things in the early religious life of the Greeks which can be explained only by taking into account the popular association of thunder and rain and fertility.

Belief in a connection between thunder and vegetation is still as hardy and thriving in Europe as is any plant. In Westphalia, for instance, thunder early in the year means a fruitful year. In Swabia, frequent thundering in May signifies a bountiful year. When a troll who heard thunder asked his wife what the noise was she replied: "That is the peasant; he is hauling grain over the bridge"²⁴¹.

Some ancient scientific men believed that thunder had a purifying effect upon water. Hippocrates²⁴² thought that water which fell while it was thundering

²²¹Interesting modern examples are given in Handwörterbuch des Deutschen Aberglaubens, 2. 320.

²²²This word is used in this sense in The Loeb Classical Library translation of Theophrastus, *Historia Plantarum* 1.6.5, but it is a 'correction' from *κεραύιον*. The same meaning is given for *κεραύιον* in Liddell and Scott, but their reference to Galen eludes my effort to check it <in ninth edition, 13.969A, in tenth edition, 19.731. C. K.>.

²²³See also Pliny 19.37. ²²⁴664 B-966 D.

²²⁵Plutarch, *Moralia* 664 F.

²²⁶*Ibidem*, 664 B; Juvenal 5.116-118.

²²⁷Plutarch, *Moralia* 664 C.

²²⁸*Ibidem*, 664 C; 912 F-913 A.

²²⁹V. S. Lean, *Lean's Collectanea: Collections by Vincent Stuckey Lean of Proverbs (English and Foreign), Folk-Lore and Superstitions, also Compilations Towards Dictionaries of Proverbial Phrases and Words, Old and Disused*, 1.405 (Bristol and London, 1902-1904).

²³⁰Plutarch, *Moralia* 664 D-E.

²³¹Apollodorus, as quoted by a scholiast on Sophocles, *Oedipus Coloneus* 705.

²³²*Themis*, 175 (Cambridge: At The University Press, 1927).

²³³*Adversus Gentes* 5.32, 34, 35.

²³⁴*Georgics* 1.331-332.

²³⁵Claudius, In *Eutropium* 1.156-162. See the references in Sir James G. Frazer's translation of Apollodorus 1.224-225 (The Loeb Classical Library). ²³⁶See THE CLASSICAL WEEKLY 18.157.

²³⁷Coin Types, 167-168 (Glasgow, J. Maclehose and Sons, 1905).

²³⁸J. C. Lawson, *Modern Greek Folklore and Ancient Greek Religion*, 52 (Cambridge: At the University Press, 1910).

²³⁹Cornutus, *Theologiae Graeciae Compendium* 6.

²⁴⁰See, for example, 168, and note 2 (see note 232, above).

²⁴¹These and many other examples of "Donner und Fruchtbarkheit des Feldes" are given in Handwörterbuch des Deutschen Aberglaubens, 2. 318-320. See also "Donner zum Zwecke des Fruchtbarkeitzaubers", *ibidem*, 2. 323-325.

²⁴²*Epidemica* 6.4.17. See also Galen, *Commentarius in Hippocratis Epidemica* 4.19 (see D. C. G. Kuhn's edition of Galen, 17, Part II, 187-189).

was more wholesome than that which fell during a windstorm unaccompanied by thunder. Theophrastus²⁴³ states that in countries where many thunderbolts occur not merely bitter waters but even fountains and entire streams of salt water change their nature.

Of the vegetation struck by lightning, trees, naturally the tall ones²⁴⁴, suffered most. Some of the Aeolians did, indeed, say that scrub-oaks, which are not lofty, were the only oaks hit²⁴⁵, but such a statement would not have won general assent in Greece and Italy. In the First Eclogue of Vergil²⁴⁶ an exile from his native land complains that everywhere there is trouble. He is sick of tending the goats. The twin offspring of one of them had to be left on stony soil. He laments that he had been too stupid to see that oaks struck by lightning had predicted this series of woes²⁴⁷. We read that, when Sulla imposed his proscriptions upon the Romans, great destruction was wrought upon oaks by Jupiter, and that, when anyone sinned against Jupiter, the god would strike an oak²⁴⁸. Servius²⁴⁹ regarded the hitting of the oak as significant because this tree was under the protection of Jupiter.

Modern records, kept for many years, of trees struck by lightning in a forest in which beech trees predominated show that oaks were hit 310 times, Scotch pine 108 times, beech 33 times, and other species a smaller number of times²⁵⁰.

... It is a plausible theory that the reverence which the ancient peoples of Europe paid to the oak, and the connexion which they traced between the tree and their sky-god, were derived from the much greater frequency with which the oak appears to be struck by lightning than any other tree of our European forests²⁵¹.

This hypothesis of Frazer is based upon suggestions and observations of Professor W. Warde Fowler, who, in a chapter of his *Roman Essays and Interpretations*²⁵², presents further data concerning the relative frequency with which various trees are struck. Professor Fowler concludes his discussion of the sky-god as follows: "... If on the very threshold of Roman religious history we find him associated with the oak as Jupiter Feretrius, we have now an explanation which so far seems to cover the facts".

A very plausible theory of the way in which the oak and the Thunderer may have become associated is thus set forth by Frazer²⁵³:

Seeing that fire on earth was regularly kindled by the rubbing of oaken sticks together, he < = early man >

²⁴³As quoted by Athenaeus 42 A.

²⁴⁴Dracontius 5.312; Aristophanes, *Nubes* 402, and scholium ad locum; Claudian, *Epistulae* 1.38-40 *Caelestis flamma... ingentes quercus, annosas fulminat ornos*.

²⁴⁵Theophrastus, *Historia Plantarum* 3.8.5. This kind of oak is called *haliphloeos* by Pliny 16.24, who borrows the second part of the name from Theophrastus. Pliny (*ibidem*) says that the frequency with which the tree was hit precluded its use in sacrifices.

²⁴⁶II.17.

²⁴⁷Lydus (47) says that, if lightning strikes a tree, one must ask what kind of tree it was, but I have not been able to find any detailed list of the various omens from the striking of different kinds of trees.

²⁴⁸Iunius Philargyrius on Vergil, *Eclogues* 1.17.

²⁴⁹On Vergil, *Eclogues* 1.17.

²⁵⁰J. R. Harris, *Boanerges*, 302 (Cambridge: At the University Press, 1913).

²⁵¹J. G. Frazer, *Balder the Beautiful*, 2.208 (London, Macmillan, 1914), and *The Magic Art*, 2.349-375. The latter passage is devoted to a study of the worship of the oak and of the close connection of this tree with thunder and the Aryan god of the heavens.

²⁵²37-41 (Oxford: At the Clarendon Press, 1920). These pages form a chapter called *The Oak and the Thunder God*.

²⁵³Frazer, 2.373-374.

might readily infer that fire in heaven was produced in like manner; in other words, that the flash of lightning was the spark elicited by some one who was lighting his fire in the usual fashion up aloft; for the savage commonly explains natural phenomena by ideas drawn from the circle of his own daily life. Similarly, people who are accustomed to make fire by means of flints suppose that lightning is produced in the same way. This is reported of the Armenians, and it may be inferred of the many peoples who believe that the flint implements of prehistoric races are thunder-bolts.

Thus it is easy to conceive how a god of the oak, viewed as the source of earthly fire, should come to be regarded as a god of the lightning, and hence, by an easy extension of ideas, as a god of thunder and rain.

In the Ozark Mountains

There is a very general belief that black walnut trees are liable to damage by lightning, and it is a hardy hillman indeed who can be persuaded to stand under one during an electrical storm²⁵⁴.

According to an item in our own lore, "Locust trees are more often struck by lightning than any others"²⁵⁵. If we may believe a popular writer on woodcraft, the oak and the ash draw lightning, but one is safe under the birch, cedar, and balsam²⁵⁶. In Europe the hazel beech and elder trees are popularly regarded as immune to damage by lightning²⁵⁷.

Another tree which seems to attract thunderbolts is the elm. Some farmers hold that a few large elm trees growing near farm buildings tend to draw the lightning to themselves and thus save barns and houses²⁵⁸.

One farmer, who has elm trees growing a short distance from his barn, reported that these trees have been struck several times by lightning within the past thirty years. He believed his barn would have been fired had there been no elm trees nearby to draw the bolt away from the buildings. Infrequently in the summer an elm tree near freshly built stacks of grain has been struck by lightning in electrical storms, indicating, this farmer believes, that trees give some protection against loss by fire.

The elm tree has some competition, however, as a protective agent.

Hemlock-trees attract lightning. It is said that you need put no lightning-rods on your buildings if you will only set up a tall hemlock pole near them. The lightning will hit that pole rather than the buildings every time²⁵⁹.

It seems that in Java even human lives are saved by the fondness of lightning for trees²⁶⁰:

Thunder-storms are extremely frequent; but the loss of life from lightning is probably diminished by the fact that the palm-trees are excellent conductors.

As there are thunder birds, so there are thunder plants²⁶¹. Greek vase paintings show the lotus and lotiform designs as thunderbolts in the right hand of Zeus. In Greece representations of the thunderbolt underwent three distinct modifications. In the first place, the petals, after being conventionalized into

²⁵⁴Vance Randolph, *The Ozarks: An American Survival of Primitive Society*, 132 (New York, The Vanguard Press, 1931).

²⁵⁵Thomas 2985.

²⁵⁶Ernest Thompson Seton, 116 (see note 29, above).

²⁵⁷T. F. Thiselton-Dyer, *The Folk-Lore of Plants*, 45, 54 (London, Chatto and Windus, 1899).

²⁵⁸This paragraph is based on a newspaper clipping, from which the following quotation was taken.

²⁵⁹C. Johnson, 69 (see note 35, above).

²⁶⁰The *Encyclopaedia Britannica*¹⁴, 12, 975, under Java.

²⁶¹See Cook 2.770-778. Interesting modern examples, such as thunder-daisy, are given on page 775.

rays, were soon transformed into naturalistic flames issuing from the floral or quasi-floral calyx. Secondly, the sepals of the calyx developed into wings, and ultimately a second pair of wings was added to balance the first pair. Lastly, the central spike of the lotus acquired a spiral twist²⁶².

In view of such developments one does not hesitate to accept the theory that the lotus flowers painted on the Hekatompedon of Pisistratus were intended, like the eagles represented upon the pediments, to avert thunderbolts²⁶³.

Associations of lightning with vegetation have continued through the ages. Much general lore of this character has been collected in Chapter 4, Lightning Plants, in T. F. Thiselton-Dyer's book, *The Folk-Lore of Plants*²⁶⁴. Still more important are the superstitions and the references given in an article entitled *Blitzbaumholz*, in a recent publication, *Handwörterbuch des Deutschen Aberglaubens*, I. 1419-1421.

There are many unrelated items of ancient thunder lore about vegetation. The twigs of all trees struck rise straight up in the direction from which the lightning came²⁶⁵. Trees which have been struck can be cured by treatment with myrrh²⁶⁶. The cucumber blossom turns as though terror-stricken as often as it thunders²⁶⁷. Figs fall when it thunders at the Vulcanalia. The remedy lies in surrounding the area of the trees in advance with barley straw²⁶⁸. If a vine is struck, it means that less wine will be produced, but, when a tree is hit, there will be a dearth of fruit²⁶⁹.

The flower of the herb called Britannica, gathered and eaten before thunder was heard, made one safe from quinsy for a whole year²⁷⁰. It was a traditional belief that, if one threw his hands behind his back and bit off a piece of wood that had been struck by lightning, and then applied it to an aching tooth, a sure cure would follow²⁷¹. One of our own prescriptions is as follows: "Pick your aching tooth with a splinter from a tree that has been struck by lightning"²⁷².

THUNDERSTONES

There was a widespread belief in antiquity that small animals and many miscellaneous objects fell from the heavens during storms²⁷³. Another prevalent idea was that certain kinds of stones descended amid thunderstorms²⁷⁴. Among them were *ceraunia* and *brontea*, 'thunderstones', and the *ombria*, 'rain-stones'²⁷⁵. The name *ceraunia* was applied to stones of

elongated form. One rare type of such stones, which were never found in any place that had not been struck by lightning, was much in demand for the practice of magic²⁷⁶.

A chaste person carrying the *lapis ceraunius* would never be struck by a thunderbolt, nor would the house or villa in which he might happen to be. One carrying it at sea was safe from bolts and squalls²⁷⁷. Coral could end a drought and avert hail, thunder, wind, and tempest²⁷⁸. The *brontea* was supposed to be able to extinguish fires started by lightning²⁷⁹. In general, stones that fell from the heavens preserved one from strokes of the thunderbolt, protected sailors in storms, and brought pleasant sleep and dreams²⁸⁰.

Naturally stones of such value were searched for and cherished. It was said that river nymphs collected them in caves in the Pyrenees²⁸¹, and we have another reference to the carrying away of such stones from Spain²⁸². German helmets flashed with them²⁸³. Two 'thunderstone gems' (*gemmae cerauniae*) were included among the adornments of a statue of Isis²⁸⁴. Juno's diadem is represented as having been enriched by such stones²⁸⁵. *Ceraunia* were among the favors that accompanied the viands during a ten days' banquet given by Elagabalus²⁸⁶.

About 1081 A. D. a Byzantine Emperor, Alexius Comnenus, sent to Henry III or IV, Emperor of the West, an *ἀστροπελέκνυς δεδεμένος μετὰ χρυσαφίου καὶ ὀποβαλσάμου*, a 'star-ax', which was evidently girded with gold and balsam in some form²⁸⁷. These words puzzled Gibbon²⁸⁸, who "endeavoured to grope out a tolerable meaning" and called the gift "a radiated crown of gold". Its identification by other scholars as a thunderstone is undoubtedly correct²⁸⁹. In a treatise²⁹⁰ which contains much curious Greek lore about stones I ran across the belief that a man carrying coral *οὔτε ὑπὸ κεραυνῷ ἢ ἀστέρῳ πληγήσεται*. I suspect that this contains another reference to a prehistoric stone implement.

Among modern scholars there is a marked tendency, which in general seems thoroughly justified, to regard

²⁷⁶Pliny 37.135.

²⁷⁷Damigeron, *De Lapidibus* 12.

²⁷⁸Orpheu Lithica 596-607, and pages 149-150 of the accompanying epitome of Orpheu Lithica in E. Abel's edition of the poem (Berlin, Calvary, 1881); Damigeron 7; Isidorus, *Origines* 16.15.25; Pliny 37.164.

²⁷⁹Pliny 37.150; Isidorus, *Origines* 16.15.24.

²⁸⁰Marbodaeus, *De Lapidibus* 428-445. This work is to be found in a supplement to Abrahami Gorlaei *Dactylithoeae*, Part II (Leyden, 1695).

²⁸¹Claudian, *Laus Serenae* 77-78.

²⁸²Apollinaris Sidonius, *Carmina* 7.49-50.

²⁸³Prudentius, *Psychomachia* 470.

²⁸⁴J. K. Orelli, *Inscriptionum Latinarum Selectarum Amplissima Collectio*, . . . No. 2510 (Zurich, 1828).

²⁸⁵Martianus Capella 1.67. 213.

²⁸⁶Lamprius, *Heliogabalus* 1.3.

²⁸⁷Anna Comnena, *Alexias* 3.10 (*Corpus Scriptorum Historiae Byzantinae*, 1839). There is now a papyrus record of an ostrich egg decorated or mounted in some way with silver. See C. C. Edgar, *Zenon Papyri in the University of Michigan Collection*, 68 (*University of Michigan Studies, Humanistic Series, Volume 24* [1931]). Pausanias (10.24.6) tells how the stone given to Cronus as a substitute for the infant Zeus was wrapped in white wool on festive occasions. The wool was doubtless in the form of filets.

²⁸⁸E. Gibbon, *The History of the Decline and Fall of the Roman Empire*, Edited by J. B. Bury, 6.103 (London, Methuen, 1898).

²⁸⁹G. Finlay, *Παρατηρήσεις ἐπὶ τῆς ἐν Ἑλλάδι καὶ Ἑλλάδι Προϊστορικῆς Ἀρχαιολογίας*, 21 (Athens, 1869); J. Evans, *The Ancient Stone Implements, Weapons, and Ornaments, of Great Britain*, 53 (New York, Appleton, 1872). Pages 50-58 contain much material that is pertinent to this paper. I have not seen Finlay's work.

²⁹⁰Orpheu Lithica, 149 (see note 278, above).

²⁶²Part of this paragraph is based on Cook 2.776-778, with but slight changes in phraseology. An important work on the form of the thunderbolt is that by Paul Jacobsthal, *Der Blitz in der Orientalischen und Griechischen Kunst* (Berlin, Weidmann, 1906).

²⁶³Salomon Reinach, *Revue Archéologique* 10 (1907), 64-65.

²⁶⁴London, Chatto and Windus, 1889. For an instructive passage see *Handwörterbuch des Deutschen Aberglaubens*, under Donner, 2.318-320. See also the index to Thomas, under Lightning, Thunder.

²⁶⁵Seneca 2.31.2.

²⁶⁶Democritus, as quoted in *Geoponica* 10.79.

²⁶⁷Palladius 4.9.8. ²⁶⁸Pliny 17.260. ²⁶⁹Lydus 47.

²⁷⁰Pliny 25.21. ²⁷¹Pliny 28.45. ²⁷²Thomas 1412.

²⁷³See THE CLASSICAL WEEKLY 24.27.

²⁷⁴See the article *Baetylia*, by F. Lenormant, in *Daremberg et Saglio, Dictionnaire des Antiquités Grecques et Romaines*, I. 642-647; C. Blinkenberg, *The Thunderweapon in Religion and Folklore*, 1-31, *et passim* (Cambridge: At the University Press, 1911); T. H. Martin, *La Foudre, l'Électricité, et le Magnétisme chez les Anciens*, 175-178, 195-206 (Paris, Didier, 1866); P. Cogels, *Céraunies et Pierres de Foudre*, *Bulletin de l'Académie Royale d'Archéologie de Belgique* 4 (1907), 1-406. ²⁷⁵Pliny 37.176.

as thunderstones many kinds of stones used in worship and ceremonial. For instance, Professor Gilbert Murray draws the following conclusion from Hesiod's account of the swallowing of the Zeus-stone by Cronos and the acquisition of thunder by Zeus²⁹¹:

... Zeus in this story is a thunder-god. The thunder or lightning is his *mana*. And not only a thunder-god, he is a thunder-stone. The identity has been, of course, disguised in our present version of the myth. It is muddled, like everything else in Hesiod. But it shows through. When Kronos sets about swallowing Zeus, it is the stone he swallows. And it is only when 'by the counsels of Earth' Cronos vomits up the stone that Zeus can take any action; and that action takes the form of thunder and lightning, the special property of a thunder-stone. In the word 'thunder-stone', or *κεραυνία*, the ancients seem to have mixed, and perhaps confused, two ideas: that of a meteorite, which seemed to be the actual bolt which fell in the thunder, and that of an ordinary flint, nephrite, jade, or the like, which has its mysterious fire inside it. The fire is the soul, or indwelling *mana*, of the flint.

Another example of the tendency to see thunderstones everywhere may be given. In describing Caligula's insane rivalry with Zeus, Dio says²⁹² that he shot stones in retaliation whenever a bolt fell. Even this story has been seized upon as evidence of the existence of thunderstone superstitions in antiquity²⁹³.

Strange to say, other things, such as pieces of wood²⁹⁴, an *ancile*²⁹⁵, and *secures*²⁹⁶ (celts?), are supposed to have fallen along with bolts. Dio²⁹⁷ mentions flying clods, stones, shells, and blood in the same breath with bolts. Forged likenesses of missiles which were supposed to have been used by Zeus in punishing the Iapygians were to be seen a long time after the event²⁹⁸.

One of the Latin scholiasts²⁹⁹ speaks of bolts which had been transformed into stones and which it was the custom to bury. Another writer says³⁰⁰ that fire carried through the air becomes stone on cooling, and that the sulphur found within stones is proof of this. Again, we are told that it is against the nature of water or of a clod of earth to rise from its position, or of fire to descend. Hence the falling of thunderstones from on high is proof of the transformation of fire in the upper regions³⁰¹.

On seeing fire flashing from a stone primitive man would naturally compare it, not to the apparently sluggish fires of the heavens such as stars and sun, but to the flashing fire of the lightning and the bolt³⁰². Classical antiquity fabricated a story to account for the latent fire in stone. Prometheus, closely pursued by Zeus while he was carrying away fire in a reed, dashed the reed against a stone and so entrusted the fire to it³⁰³.

It seems worth while to repeat here part of a paragraph already quoted from Frazer (see the quotation that follows the mark for note 253):

... people who are accustomed to make fire by means of flints sometimes suppose that lightning is produced in the same way. This is reported of the Armenians, and it may be inferred of the many peoples who believe that flint implements of prehistoric races are thunderbolts.

In modern Europe the belief is still common that belemnites and fossil sea-urchins, which are popularly called 'thunderstones', fall during thunderstorms. They are supposed to be able to afford protection against lightning both to person and to property³⁰⁴. The adjective 'elongated', as applied by the ancients to the *ceraunia*, describes the belemnite equally well. There is evidence which indicates that superstitions about belemnites have an unbroken tradition from antiquity³⁰⁵.

Shakespeare has several interesting references to thunderstones:

Are there no stones in heaven
But what serve for the thunder?³⁰⁶

And, thus unbraced, Casca, as you see,
Have bared my bosom to the thunder-stone³⁰⁷.

Fear no more the lightning flash,
Nor the all-dreaded thunder-stone³⁰⁸.

In northeastern Scotland

... Flint arrows and spear-heads went by the name of 'faery dairts,' whilst the kelts were called "thunderbolts," and were coveted as the sure bringers of success, provided they were not allowed to fall to the ground. When an animal died suddenly the canny woman of the district was sent for to search for the "faery dairt," and in due course she found one, to the great satisfaction of the owner of the dead animal³⁰⁹.

A curious piece of negro lore is to be found in Julia Peterkin's story, Black April³¹⁰:

As a fearful crash shook the earth, Big Sue opened the back door and peeped out and quavered, "Git up, Breeze! Lightnin' is struck dat big pine yonder, close to April's house! It's afire! Dat bolt shooen de whole earth. I bet April'll find it. Lawd! E's been diggin' at de roots o' struck trees to git a bolt a long time! An' now one mighty nigh hit him!"

"What's a bolt, Cun Big Sue?"

The wind howled as she answered, "Why, son, a thunder bolt is a' iron rod. If you finds one, you'll have de power to rule life an' death!"³¹¹

After thunderstones had been endowed with the power of averting thunder, it was almost inevitable that thunderbolts themselves should be supposed to have similar qualities. Perhaps this was the reason why bolts were sometimes sculptured on the entablatures of temples³¹²; since the eagle, which carried thunderbolts, was sculptured on temples to avert

²⁹¹Anthropology and the Classics, edited by R. R. Marett, 86 (Oxford: At the Clarendon Press, 1908). See also J. R. Harris, Boanerges, 283-284 (see note 250, above); J. E. Harrison, Themis², 56-61 (see note 232, above); G. Wissowa, Religion und Kultus der Römer², 117 (Munich, Beck, 1912).

²⁹²Dio 50.28.6. The translator in the Loeb Classical Library makes Dio say that Caligula "would in turn hurl a javelin at a rock..." I have seen other translations that could have been improved by a little knowledge of folklore.

²⁹³Blinkenberg, 29-30 (see note 274, above). ²⁹⁴Pausanias 9.12.4. ²⁹⁵Ovid, Fasti 3.361-392. The 'shield' may have been a meteoric stone.

²⁹⁶Suetonius, Galba 8. ²⁹⁷40.47.2. ²⁹⁸Athenaeus 523 A-B. ²⁹⁹On Persius 2.26. ³⁰⁰Nemesius, De Natura Hominum 5.12.

³⁰¹Ioannes Philoponus, De Aeternitate Mundi 10.3. ³⁰²See E. B. Tylor, Primitive Culture², 2.262 (New York, Putnam's, 1920). ³⁰³Probus on Vergil, Eclogues 6.42.

³⁰⁴Blinkenberg, 76-83 (see note 274, above).

³⁰⁵See E. S. McCartney, On Fossil Thunderstones and Fingerstones, The Classical Journal 18 (1923), 425-426.

³⁰⁶Othello 5.2. 234-235.

³⁰⁷Julius Caesar 1.3. 48-49.

³⁰⁸Cymbeline 4.2. 270-271.

³⁰⁹W. Gregor, Notes on the Folk-Lore of the North-East of Scotland, 184 (London, Published for the Folk-Lore Society, 1881).

³¹⁰260-261 (<New York>, Grosset and Dunlap, 1927).

³¹¹Other valuable references to thunderstones are to be found in H. Balfour, Concerning Thunderbolts, Folk-Lore 40 (1929), 37-49; Handwörterbuch des Deutschen Aberglaubens, 1. 1413-1414, 1419, 1422-1423, 2.325-331.

³¹²Ittruvius 4.3.6.

lightning, representations of bolts may have served the same purpose³¹³.

LAPIS MANALIS

Outside the Porta Capena of Rome there was kept a *lapis manalis*, which was escorted into the city with proper ceremonies whenever the Romans wished to end a drought³¹⁴. The suggestion has been made that the stone may have been a primitive representation of the thunder-wagon³¹⁵. There is an ancient statement, however, that *lapides manales* were stones in the form of cylinders³¹⁶, evidently for convenience in dragging them about the bounds of a site.

As we shall see, an attempt has been made to associate the weather properties of the *lapis manalis* with the *manes*³¹⁷. The most recent theory suggests that the *lapis manalis* was an aërolite and notes that stones which fell from heaven were much honored in antiquity³¹⁸.

DEATH AND STORMS

Storms, like comets, are frequently associated with death. Near Britain there were some desolate islands where demons and demigods were said to dwell. The inhabitants accounted for tempestuous weather by saying that one of these beings had died. The people compared them to lamps, which, while lighted, offend nobody with their scent, but, on being extinguished, annoy everybody with the odor which they send forth³¹⁹.

In classical lore it was the general belief, however, that death was portended by bolts and thunderstorms or else took place while Nature was in an angry mood. Oedipus regarded repeated claps of thunder and the numerous bolts flashing from the invincible hand of Zeus as sure signs of his approaching death³²⁰. On the Athenian retreat from Syracuse heavy thunderstorms, though seasonal, were looked upon by the invaders as omens of their destruction³²¹.

Prior to the death of Cicero vast numbers of bolts had fallen, some of which descended upon the shrine of Capitoline Jupiter³²². When Antony proposed some astonishing laws, the heavens were filled with peals of thunder and flashes of lightning, but Antony, though an augur, regarded them as of no significance and so brought the many calamities of civil war upon the city and the world³²³.

The death of Claudius seemed to have been in-

dicated, says Dio, by a number of omens, among which was a thunderbolt that struck the standards of the pretorian soldiers³²⁴. It was an ominous portent when a bolt, like a harpy snatching food, consumed the dinner of Nero as it was being brought to him³²⁵.

In 217 A. D. 'the hunting theater' (i. e. the Colosseum) was struck with bolts on the very day of the Vulcanalia and a disastrous blaze ensued, so that Macrinus had sufficient warning that he would not long survive³²⁶. In 375 A. D. there was a terrific clap of thunder and a bolt set fire to part of the palace, *curia*, and forum at Sirmium, dooming Valentinian to death³²⁷.

While he was campaigning beyond Ctesiphon, the Emperor Carus died of disease or was murdered during a thunderstorm. So common had the fashion become of ascribing the deaths of great men to lightning that such a report spread about Carus's death, as is attested by several authors³²⁸. It was explained that the fate of Carus was just, since an oracle had shown that Roman arms could go victoriously only as far as Ctesiphon³²⁹.

The early history of Rome provides several examples. Romulus Silvius³³⁰ and Numa³³¹ perished by thunderbolts. One version of the death of Tullus Hostilius says that he was murdered by Ancus Martius during a violent storm³³². There is a tradition that the death of St. Simeon Stylites was due to a thunderbolt³³³.

It is surprising how frequently translation to heaven was accompanied by storms. Thunderbolts ignited and consumed the funeral pyre of Hercules³³⁴. Iolaus and his companions went to gather up the bones, but found none at all. They believed that, in accordance with the oracles, Hercules had been translated to the gods³³⁵. The final wonder that attended the birth of Dionysus was the ascent of his mother to heaven³³⁶.

Maddened by the loss of her daughter Selene, Basilea played wildly upon a timbrel and a cymbal and became a terror to spectators. When some of them attempted to seize her, a terrible rainstorm arose, accompanied by steady falling of bolts, and she was never seen again. Persuaded that she had become a goddess, the people built altars and made sacrifices to her and even instituted other divine rites and ceremonies in her honor³³⁷.

According to some accounts, both Aeneas³³⁸ and Romulus³³⁹ were translated during severe thunderstorms.

The most interesting illustration outside classical lands is that of Zoroaster, who claimed the power of

³¹³S. Reinach, *Cultes, Mythes et Religions*, 3.73-74 (Paris, E. Leroux, 1908).

³¹⁴See M. H. Morgan, *Greek and Roman Rain-Gods and Rain-Charms*, Transactions and Proceedings of the American Philological Association 32 (1901), 83-109.

³¹⁵H. Usener, *Rheinisches Museum* 60 (1905), 19, note 1 (the suggestion was made in the course of an article entitled *Keraunos*, which covers pages 1-30). See also Preller-Jordan, *Römische Mythologie*, 1.354-355 (Berlin, Weidmann, 1881); O. Gruppe, *Griechische Mythologie und Religionsgeschichte*, 776, note 2 (Munich, Beck, 1906); Frazer 1.310.

³¹⁶Fabius Plancius Fulgentius, *De Prisco Sermones*, under *Manales Lapides*.

³¹⁷See the text connected with note 341, below.

³¹⁸Fiedler 65-70. ³¹⁹Plutarch, *Moralia* 419 E-F.

³²⁰Sophocles, *Oedipus Coloneus* 1510-1515. Compare 1604-1609.

³²¹Thucydides 7.79.2-3.

³²²Dio 45.17.2-4. It is recorded that the death of Severus was indicated when his statue was struck by a bolt: see Dio Cassius 77.11.2, in *The Loeb Classical Library* 9.261, 263, which = Xiphilinus 321.20-24, in the edition of R. Stephanus.

³²³Dio 45.27.2-5.

³²⁴60.35. ³²⁵Dio 61.16.5.

³²⁶Dio 79.25.1-2. ³²⁷Ammianus Marcellinus 30.5.16.

³²⁸Vopiscus, *Carus* 8.2-5; Eutropius 9.18; Aurelius Victor, *De Caesaribus* 38, *Epitome* 38; Georgius Syncellus, *Chronographia*, page 724 (*Corpus Scriptorum Historiae Byzantinae*); Zonaras, *Annales* 12.30.

³²⁹Aurelius Victor, *De Caesaribus* 38.3-4. ³³⁰Livy 1.3.9.

³³¹Plutarch, *Numa* 22.7.

³³²Dionysius 3.35.4. Compare Zonaras, *Annales* 7.6.

³³³Joannes Moschus, *Pratum Spirituale*, Chapter 57 (*Migne, Patrologia Graeca* 87, Part III, 2911); *Patrologia Latina* 74.147.

³³⁴The funeral pyre is called the *thesaurus* of Zeus by Euripides, *Supplices* 1010-1011.

³³⁵Diodorus 4.38.4-5.

³³⁶Philostratus, *Imagines* 1.14.

³³⁷Diodorus 3.57.7-8.

³³⁸Aurelius Victor, *Origo Gentis Romanae* 14.2.

³³⁹Plutarch, *Romulus* 27.6-7; Livy 1.16.1; Dionysius of Halicarnassus 2.52.2 (compare 63.3); Ovid, *Fasti* 2.492-496; Zonaras, *Annales* 7.4.

luring down sparks from the stars. He prayed that he might be destroyed by lightning, a fate which is said actually to have befallen him. There is a tradition that he was carried to heaven by a bolt and was made a star³⁴⁰.

It is in a more or less casual manner that a number of my sources, especially those of late date, mention death by a bolt or during a storm; in some works the statements about bolts and storms are introduced only after longer and more trustworthy accounts have been given. This point is important, since it shows how firmly fixed was the tradition that people died during storms. Death at such a time was not unlike going out with the tide.

It seems that the spirits of the dead could cause rain or be invoked to send it. A recent investigator³⁴¹ comes to the conclusion that the *lapis manalis* which the Romans escorted into the city when there was urgent need of rain had nothing to do with Jupiter, but was in some way connected with the *manes*. He ransacks folklore literature and finds many illustrations of a belief in the ability of the dead to affect the weather. It may not be amiss to note in this connection that, according to peasants of Mauretania, when any part of the grave of Antaeus was dug out, rain began to fall and continued until the earth was replaced³⁴².

In the celebrated calling down of Jupiter from heaven by Numa, the god said that Numa must charm thunder and lightning with 'heads', a prescription which Numa managed to turn aside from men by verbal subtlety³⁴³. This suggests another remarkable tale of a head in weather lore. After the Battle of Philippi Antony buried the body of Brutus, except the head, which was to be sent to Rome. During the voyage from Dyrrachium across the Adriatic the ships encountered a storm, and the head was thrown into the sea³⁴⁴. Doubtless the head was intended to appease the storm, since sacrifices were made to the sea when expeditions were ready to set out from shore³⁴⁵. It was the custom of the Saxons, on setting out from an enemy's coast on the homeward journey, to sacrifice every tenth captive to the waters³⁴⁶. It is possible, however, that the head of Brutus may have been looked upon as bringing bad luck³⁴⁷.

In parts of our own country it is believed that

³⁴⁰Clemens Romanus, *Recognitiones* 4.27-28 (Migne, *Patrologia Graeca*, 1.1327). According to some accounts, Zoroaster, when he was near death, urged the Persians to guard his ashes, because on their preservation would depend the safety of the kingdom. See Chronicon Pascale, 1.67 (*Corpus Scriptorum Historiae Byzantinae*), and Michael Glycas, *Annalium Pars II* (*ibidem*, 243, 244); Suidas, under *Λυποδότης*.

³⁴¹E. Samter, *Alttrömischer Regenzauber*, *Archiv Für Religionswissenschaft* 21 (1922), 317-339, especially 331-339.

³⁴²Pomponius Mela 3.10. On the general subject of rain and the dead see Fiedler 58-59.

³⁴³Plutarch, Numa 15. See also Ovid, *Fasti* 3.339-341, and *THE CLASSICAL WEEKLY* 18.163.

³⁴⁴Dio 47.49.2. For an interesting passage on calming the troubled waters of the Adriatic Sea, *vorago navigantium*, with a nail supposed to have come from the wood of the true cross see Gregory of Tours, *De Gloria Martyrum* 1.6 (Migne, *Patrologia Latina*, 71.710).

³⁴⁵See, for example, Livy 29.27.5; Cicero, *De Natura Deorum* 3.51. Compare Vergil, *Aeneid* 5.814-815 *Unus erit tantum amissum quem gurgite quaeres: unum pro multis dabitur caput*.

³⁴⁶Sidonius 8.6.15.

³⁴⁷Plutarch (Cato the Younger 15.4) tells how Cato had a perilous voyage from Asia to Brundisium after taking the ashes of Caepio on board his own ship, whereas the other vessels made the trip with little trouble.

"There will always be a storm after the death of an old woman"³⁴⁸. A writer of a sea story that was popular a few years ago says³⁴⁹: "An old sailor taught me that thunder was the growling curse of a dead sea captain who had lost his course; the blinding flashes of lightning were the combined sparkles of bar-maids' eyes luring seamen to a pleasant harbor. . ."

A superstition in Brittany is that the death of usurers or of rich people who have been harsh toward the poor is always followed by furious thunderstorms or by lightning. The raging elements do not subside so long as the corpse remains in the house³⁵⁰.

A superstition prevails among the lower classes of many parts of Worcestershire, that when storms, heavy rains, or other elemental strifes, take place at the death of a great man, the spirit of the storm will not be appeased till the moment of burial. This superstition gained great strength on the occasion of the Duke of Wellington's funeral, when, after some weeks of heavy rain, and one of the highest floods ever known in this country, the skies began to clear, and both rain and flood abated. The storms which have been noticed to take place at the time of the death of many great men known to our history, may have had something to do with the formation of this curious notion in the minds of the vulgar. It was a common observation hereabout in the week before the interment of his Grace, "Oh, the rain won't give over till the Duke is buried"³⁵¹.

In England a high wind used to be regarded as an omen of the death of a distinguished person, as we may see from an entry in Pepys's Diary³⁵²:

Waked with a very high wind, and said to my wife, "I pray God I hear not of the death of any great person, this wind is so high!" fearing that the Queene might be dead.

At the present time there is a saying that "Winter thunder is to old folks death, and to young folks plunder"³⁵³. The current superstition that "Thunder after a funeral shows that the spirit of the deceased has gone to heaven"³⁵⁴ reminds one of ancient stories about translation during thunderstorms.

SPIRITS AND DEMONS AS CAUSES OF BAD WEATHER

Another source of storms and of bad weather in general lay in spirits and demons, which inhabited the air above the earth³⁵⁵. Such ideas have a long ancestry; in distant Chaldea, it was said, thunderings were the voices of aerial powers and lightnings their running³⁵⁶. Even the Pythagoreans believed that such phenomena were caused by spirits, which they assigned to the space between heaven and earth³⁵⁷.

References to weather activities of demons become

³⁴⁸Journal of American Folk-Lore 40 (1927), 187. Compare *ibidem*, 196, "When an old person dies there is always a change in the weather".

³⁴⁹Joan Lowell, *The Cradle of the Deep*, 10 (New York, Simon and Schuster, 1929).

³⁵⁰P. Sébillot, *Le Folk-Lore de France*, 1.72 (Paris, E. Guilmoto, 1904-1907).

³⁵¹The Gentleman's Magazine 205 (1858), Part II, page 375. For the association of storms with the deaths of famous persons see V. S. Lean's *Collectanea*, 2.588, 589 (see note 229, above). See also Hessische Blätter für Volkskunde 3 (1904), 116; *Zeitschrift für Ethnologie* 15 (1883), 120-121.

³⁵²Entry for October 9, 1663.

³⁵³D.80. ³⁵⁴Thomas 782.

³⁵⁵See G. L. Hamilton, *Storm-Making Springs: Rings of Invisibility and Protection. Studies on the Sources of the Yvain of Chrétien de Troies*, *Romanic Review* 5 (1914), 213-237, especially 226-227.

³⁵⁶Lydus 21. ³⁵⁷*ibidem*.

rather frequent in Christian literature³⁵⁸. With the utmost assurance Clemens Alexandrinus³⁵⁹ says that hail and storms in general arise not merely from a disturbance of the elements, but also from the wrath of demons and angels that are not good. There is an interesting record of an attempt to discredit the account of the divine use of the weather to aid the 'Thundering Legion' in its battle with the Quadi. A story was circulated to the effect that a certain Arnuphis, an Egyptian magician, had employed magic arts to call upon demons and that they had sent the rain for the legionaries³⁶⁰.

Perhaps it was an effort to combat the very common belief in demonic weather agents that caused some Christians to say that thunder was the preaching of saints who, with loud tones, dinned in the ears of the faithful the means by which the world, having been warned, could be brought to recognize its sins³⁶¹.

STORM-MAKING OBJECTS

Many objects were supposed to possess the power of arousing storms³⁶². In the *Iliad* ³⁶³ Zeus employs his tasseled aegis to cover Mount Ida with clouds. Then he lightens and thunders. According to one ancient scholar³⁶⁴, Zeus received the aegis to stir up the clouds and the thunder above us. With the problem whether the aegis was a goat skin or a personification of the storm cloud I am not much concerned³⁶⁵.

The lock of the Gorgon's hair was a somewhat similar device. The view has been expressed that it was a talisman which, when exposed to view, brought on a storm of thunder and lightning to strike panic into a foe³⁶⁶.

Much lore of a somewhat similar character can be found in classical handbooks on religion and mythology³⁶⁷.

WAYS OF AVERTING THUNDER AND LIGHTNING AND THEIR ILL EFFECTS

Thunder was regarded as friendly to man to the extent that it was looked upon as a necessary antecedent to beneficial rain. In fact, one of the stereotyped ways to induce rain was to make a noise like thunder³⁶⁸, but thunder and thunderbolts may be inconsiderately violent, and hence man has sometimes tried to find means of averting them. Examples of supposed prophylactics against these phenomena have been given

in THE CLASSICAL WEEKLY. They consist of animals or parts of them (16.7)³⁶⁹, plants (17.108)³⁷⁰, charms, especially stones (18.163), and sacrifice (18.155).

By the principle of homeopathic magic noises, too, seem to have been effective against the rumbling thunder. Euripides³⁷¹ represents Cyclops as saying that he does not fear the weapons of Zeus and as making a din to outdo that of Zeus. According to a theory offered by Sir James G. Frazer³⁷², the noise made by the gong at Dodona was "meant to mimic the thunder that might so often be heard rolling and rumbling in the coombs of the stern and barren mountains which shut in the gloomy valley"³⁷³. Since thunderstorms were frequent at Dodona³⁷⁴, perhaps too frequent, it is not impossible that the striking of the gong was intended to keep them away, especially if there were demons of thunder³⁷⁵, as there undoubtedly were demons of the weather in general. Brazen instruments were struck during eclipses, presumably in an effort to frighten away the monster that was devouring the sun or the moon³⁷⁶.

Another sound to be associated with such lore is that made by the lips when lightning occurred³⁷⁷. Pliny³⁷⁸ thinks that this method of greeting lightning, which was in general use among ancient nations, was a form of worship, but it is more probable that the sounds were apotropaic. "The reason for the custom was explained by the Pythagoreans³⁷⁹ to be, that by acting thus one frightened the spirits in Tartarus, who were doubtless supposed to make the thunder and lightning"³⁸⁰. A more recent suggestion is that the sounds were meant to avert the danger of being struck by lightning³⁸¹.

The Pythagoreans made some other kind of noise to accompany the cheeping or the smacking of the lips³⁸², but we are not informed what it was³⁸³.

In medieval times, when it was a prevalent belief

³⁶⁹There is some material on this subject in the present paper under the caption Thunder and Animal Life. For another mention of the use of the sealskin to provide protection against the thunderbolt see F. de Mély, *Les Lapidaires de l'Antiquité et du Moyen Age*, 41 (Paris, E. Leroux, 1878).

³⁷⁰See also the caption Thunder and Vegetation in the present paper, and E. S. McCartney, *Why Did Tiberius Wear Laurel in the Form of a Crown during Thunderstorms?*, *Classical Philology* 24 (1929), 201-203.

³⁷¹Cyclops 320-328. Dio (50.28.6) tells us that Caligula had a device by which he tried to match thunder with thunder and lightning with lightning. ³⁷²The Magic Art, 2.358.

³⁷³Stage thunder was likewise created by means of bronze, i. e. a bronze vessel, according to the scholiast on Aristophanes, *Clouds* 292. ³⁷⁴See note 137, above.

³⁷⁵It is clear from Theocritus 2.36 that gongs were struck to keep off evil spirits. See also Porphyrius, *Vita Pythagorae* 41. In an article by A. B. Cook, *The Gong at Dodona*, *Journal of Hellenic Studies*, 22 (1902), 5-28, it is suggested that the gong at Dodona was struck to ward off evil influences. The scholiast Q on Homer, *Odyssey* 11.48 explains that it was a common belief that demons feared iron.

³⁷⁶See K. F. Smith, *The Elegies of Albius Tibullus*, Edited, etc., 347-348 (New York, American Book Company, 1913).

³⁷⁷Pliny 28.25; Aristophanes, *Vespae* 626, and a scholium on the verse. ³⁷⁸28.25.

³⁷⁹Aristotle, *Analytica Posteriora* 2.10 (11).8. I was much surprised to find part of this passage rendered as follows in the Oxford translation of Aristotle, edited by W. D. Ross: "...if thunder be a hiss and roar necessarily produced by the quenching of fire, and also designed, as the Pythagoreans say, for a threat to terrify those that lie in Tartarus". If this translation is correct, many writers on religion and folklore are wrong. See note 292, above.

³⁸⁰J. G. Frazer, *Folk-Lore* 1 (1890), 153. Compare Ernst Riess, in the article on *Aberglaube* in Pauly-Wissowa, 1.43: "...So wird man im *poppyismus* wohl einen religiösen Brauch sehen dürfen des Sinnes, dass der Mensch dem Gott im Kampf hilft". ³⁸¹Cook 2.827. ³⁸²Aristotle, as cited in note 379, above.

³⁸³On the apotropaic use of noises, especially in weather lore, see Fiedler 28-31.

³⁵⁸See pages 226-227 of the article cited in note 355, above, and also a section on Diabolic Agencies in Storms, in Andrew D. White, *A History of the Warfare of Science with Theology in Christendom*, 1.336-350 (New York, Appleton, 1896). For specific references see Tertullian, *Apologeticus* 22-23; Bonaventura, *Compendium Theologiae Veritatis* 2.26; Thomas Aquinas, *Summa Theologica* 1.80.2.

³⁵⁹*Stromata* 6.3.

³⁶⁰Dio 72.8.4 (The Loeb Classical Library 9.28).

³⁶¹Isidorus, *De Natura Rerum* 20.2.

³⁶²See THE CLASSICAL WEEKLY 18.164 (under Local Phenomena), 24.28 (under Caves), and also the article named in note 355, above.

³⁶³17.593-595. See also Vergil, *Aeneid* 8.352-354; Silius Italicus 12.719-724.

³⁶⁴Cornutus, *Theologiae Graecae Compendium* 9.

³⁶⁵See Roscher, under *Aegis*, 1.150; Pauly-Wissowa, under *Aegis*, 1.971; Fiedler 49-50.

³⁶⁶W. H. Roscher, *Die Gorgonen und Verwandtes*, 80 (Leipzig, Teubner, 1879).

³⁶⁷See, for example, Roscher, under *Graiai*, 1.1731-1732, 1737, and under *Athene*, 1.676-678; O. Gruppe, 2.818-848, *passim* (see note 315, above); Fiedler, *passim*.

³⁶⁸The case of Salomoneus is cited in THE CLASSICAL WEEKLY 18.157.

that evil spirits stirred up foul weather, bells were used to keep them away or to put them to flight³⁸⁴. An inscription on a bell in Switzerland reads: A fulgure grandine et tempestate libera nos domine Jesu Christe³⁸⁵.

The views of the Middle Ages with respect to supernatural storms have been well summed up as follows³⁸⁶:

"It is," says Thomas Aquinas, "a dogma of faith that the demons can produce wind, storms, and rain of fire from heaven. The atmosphere is a battle-field between angels and devils. The latter work the constant injury of man; the former his melioration; and the consequence is that changeableness of weather which threatens to frustrate the hopes of industry. And when Lucifer is able to bestow even upon man—on sorcerers and wizards—the power to destroy the fields, the vineyards and dwellings of man by rain, hail and lightning, is it to be wondered at if the Church, which is man's protection against the devil, and whose especial calling it is to fight him, should in this sphere also be his counterpoise, and should seek from the treasury of its divine power, means adequate to frustrate his atmospheric mischiefs? To these means belong the church bells, provided they have been duly consecrated and baptized. The aspiring steeples around which cluster the low dwellings of men, are to be likened, when the bells in them are ringing, to the hen spreading its protecting wings over its chickens; for the tones of the consecrated metal repel the demons and avert storm and lightning."

An interesting Scotch method of averting by means of noise the evil effects of thunder may be cited in this connection³⁸⁷:

During thunder it was not unusual for boys to take a piece of thin wood a few inches wide and about half-a-foot long, bore a hole in one end of it, and tie a few yards of twine into the hole. The piece of wood was rapidly whirled round the head, under the belief that the thunder would cease, or that the thunderbolt would not strike. It went by the name of "thunder-spell"³⁸⁸.

There are other curious ways of escaping the menaces of thunder. "When the Esthonians hear thunder for the first time in the year, they strike their heads thrice with a stone, as a charm against its evil effects"³⁸⁹.

One of the prescriptions from our own lore is as

follows: "When there is lightning make the sign of the cross and you will not be struck by it"³⁹⁰.

In antiquity words too might be used in averting thunderbolts. The Geoponica³⁹¹ recommends resorting to prayer to ward off earthquakes and bolts. The old Tuscan incantation, *arse verse*, 'avert fire'³⁹², was doubtless intended to help save thatched huts from fire from heaven, although the danger of fire from within was far greater.

Another method of contending with the elements was violence³⁹³. Heracles aimed an arrow at the sun because its heat made him uncomfortable³⁹⁴. Herodotus³⁹⁵ says that the Getae menaced their god by shooting arrows against both thunder and lightning. Their practice is paralleled by a custom among the Ogillalah Indians³⁹⁶:

Whenever a storm which they wished to avert was threatening, the thunder-fighters would take their bows and arrows, their guns, their magic drum, and a sort of whistle, made out of the wing-bone of the war-eagle, and, thus equipped, run out and fire at the rising cloud, whooping, yelling, whistling, and beating their drum, to frighten it down again.

The Greek habit of putting out fires during thunderstorms³⁹⁷, which is paralleled among the Germans, has been explained as due to a wish to "avoid attracting the attention of the thunder demons"³⁹⁸. In modern lore, too, fire is supposed to attract the fire of lightning. Mark Twain makes literary use of this belief in a short story called Mrs. McWilliams and the Lightning³⁹⁹. When her husband disregards all common sense precautions against attracting lightning, Mrs. McWilliams's temper breaks forth:

What are you doing?—lighting a match at such a time as this! Are you stark mad?"

"Hang it, woman, where's the harm? The place is as dark as the inside of an infidel, and—"

"Put it out! put it out instantly! Are you determined to sacrifice us all? You *know* there is nothing attracts lightning like a light. [Fzt!—crash! boom—boloom—boom—boom!] Oh, just hear it! Now you see what you've done."

(To be continued)

UNIVERSITY OF MICHIGAN

EUGENE S. MCCARTNEY

³⁸⁴E. Stemplinger, *Antiker Aberglaube in Modernen Ausstrahlungen*, 86 (Leipzig, Dieterich, 1922). See also *Handwörterbuch des Deutschen Aberglaubens*, I. 1417–1418; E. Hirsch, *Glocke als Wetterzauber beim Friedberger Judenbad von 1260*, in *Cimbria. Beiträge zur Geschichte, Altertumskunde, Kunst und Erziehungslehre*, . . . 95–103 (Dortmund, Ruhfus, 1926). This book is rare in this country; there is a copy, however, in the New York Public Library).

³⁸⁵Stemplinger (see note 384).

³⁸⁶Viktor Rydberg, *The Magic of the Middle Ages*, translated from the Swedish by A. H. Edgren, 73–74 (New York, Holt, 1879).

³⁸⁷W. Gregor, 153 (see note 309, above).

³⁸⁸The ancients had bull-roarers to imitate thunder, but I can cite no example of their use to repel thunder. See J. E. Harrison, 61–62 (see note 232, above).

³⁸⁹C. Swainson, *A Handbook of Weather Folk-Lore*, 215 (Edinburgh and London, W. Blackwood and Sons, 1873).

³⁹⁰*Journal of American Folk-Lore* 40 (1927), 188, No. 1046.

³⁹¹I. 12.37. ³⁹²*Festus* 17 (Lindsay).

³⁹³See *THE CLASSICAL WEEKLY* 18.165–166, and Fiedler 31–33.

³⁹⁴*Apollodorus* 2.5.10. ³⁹⁵*Herodotus* 4.94.

³⁹⁶F. Parkman, *The Oregon Trail*, 176 (in the edition by W. E. Leonard [Boston, Ginn, 1910]).

³⁹⁷Aristotle, as cited in note 379, above.

³⁹⁸J. G. Frazer, *Folk-Lore* I (1890), 153. See also Fiedler 55.

³⁹⁹In *The American Claimant and Other Stories and Sketches*, 301 (in volume 21 of the Hillcrest Edition of Mark Twain's works [Hartford, The American Publishing Company, 1903]). Among the things that Mrs. McWilliams thinks dangerous during a storm are lying in bed, standing by a fireplace or a window, and putting on woollen clothes. Compare, however, *The Folk-Lore* I (1892), 68, "A feather bed will keep the lightning away".



Classical Weather Lore of Thunder and Lightning (Concluded)

Author(s): Eugene S. McCartney

Source: *The Classical Weekly*, Vol. 25, No. 25 (May 9, 1932), pp. 212-216

Published by: [Classical Association of the Atlantic States](#)

Stable URL: <http://www.jstor.org/stable/4339106>

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Deucalion am I, saved from the cruel wave, related to earth, but harder far than it. Let one letter drop: the name of a flying creature too I shall have.

The solution is a stone (*lapis*); if from *lapis* the first letter be taken, *apis* is the result.

The instances cited above have been chosen to illustrate particular points. Many other enigmas of equal or even greater interest might be quoted as examples of Symphosius's wide range of subjects. The enigmas are thoroughly pagan in character; they include for the most part objects closely associated with the daily life of man. They fall into no definite groups, though there is a tendency to associate those dealing with similar or related subjects. For instance, we have a group dealing with animals (14-39), another with plants, flowers, vegetables, and food-stuffs (40-50); many deal with articles of clothing and personal adornment, tools and implements of domestic use, structures of everyday use (such as ship, bridge, ladder); finally, several deal with natural phenomena (such as clouds, rain, snow). The range is considerable and the variety interesting. Some are easily guessed; others (such as 94, One-Eyed Garlic Vendor) would be impossible of solution without the lemmata.

How many of these riddles are strictly original with Symphosius we have no way of telling, for it would be quite wrong to infer that all those other than the half-dozen or so for which parallels can be found in Greek literature²⁹ originated with him.

Although we cannot accurately gauge our indebtedness to Symphosius as the originator of the enigmas he gives, we owe to him their preservation in a poetic form of no mean merit. He has been rightly termed "in one sense the father of the riddles of our era. . ."³⁰ He is to riddle-writing what Martial was to the epigram: he gave it artistic form, and set the standard for future generations. As one critic has said, "...The enigmas of Symphosius have dominated all riddles, both artistic and popular, since his day. . ."³¹ He set the fashion for writing them in groups of a hundred. The fashion of writing things in groups of a hundred persists; witness such a title as *A Century of Charades*³². Symphosius's enigmas influenced widely all riddle-writing of the Middle Ages. The anonymous scribe who refashioned in Latin the Hellenistic story of the wanderings of Apollonius, King of Tyre, embellished the tale with ten enigmas taken from Symphosius³³. Three of these passed with the Apollonius story into the *Gesta Romanorum*³⁴. Alcuin paraphrased seven for the instruction of his royal pupil, Pepin the Short³⁵. We find traces of Symphosius's influence in the so-called *Bern Riddles*³⁶, and in the Anglo-Saxon riddles of the *Exeter Book*. Symphosius's greatest follower was Aldhelm, the great riddle-writer of eighth-century England, who

acknowledges his indebtedness to Symphosius in his treatise on prosody, which serves as a prose introduction to his own hundred enigmas (the *Epistola Ad Acircium*, or *Liber De Septenario*), and quotes no less than a dozen lines from his predecessor. Archbishop Tatwine was the next ecclesiastical writer of riddles. He completed only forty. These were shortly afterward supplemented by Eusebius, who brought the number up to one hundred, thus continuing the tradition established by Symphosius and followed by Aldhelm.

The editio princeps of Symphosius was prepared by Joachimus Perionius (Paris, 1533). Perionius, in a brief and quaintly worded Prefatio, after expressing his delight in chancing upon the work of so interesting an author and his desire to save this excellent work from oblivion, passes judgment upon Symphosius in terms which still hold good:

De puritate quidem Latini sermonis, cum iis qui supra mille annos scripserunt... facile contenderit. Paucis vero antiquorum palmam apte dicendi concesserit, ut qui res obscurissimas tractet planissime, in quo vis ingenii perspicui potest vel maxima. Iam vero rerum earum quas tractat, vim eum et naturas plane tenuisse, vel ex hoc intellegi potest, quod artem magna ex parte in iocos, risus et sales contulit, in quibus peritia sola dominatur.

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CLASSICAL WEATHER LORE OF THUNDER AND LIGHTNING

(Concluded from page 208)

ELICITING THE THUNDERBOLT

The ancients were interested not only in averting the thunderbolt, but also in drawing it down for their own benefit. Servius⁴⁰⁰ goes so far as to state that Prometheus understood 'the method of eliciting thunderbolts', and that he imparted this knowledge to mankind, and hence was said to have stolen fire. The Stoics interpreted the story of the throwing of Hephaestus from heaven as meaning that man originally lighted his fires by lightning and the heat of the sun⁴⁰¹. We are told that at one time man did not apply fire to altars, but elicited by prayers the divine fire which ignited them⁴⁰².

There were Thessalian enchantresses who by their voices alone could bring down clouds and rains, and even thunder, without the permission of Zeus⁴⁰³. The Etruscans used rites and incantations to effect the same results upon bolts⁴⁰⁴.

The Romans of the regal period and the Etruscans seem to have been more accustomed, however, to bringing down the bolt by dealings with Iuppiter Elicius himself. Though he may have had to do with rain originally, he was more generally thought of as the god from whom the bolt was to be drawn⁴⁰⁵.

²⁹For example, those on Smoke (7), Vine (53), Ball (59), Saw (60), and Sleep (99) repeat the queries, if not the form, of several enigmas in the Palatine Anthology, Book 14. But such queries, like the riddle on the Louse (30), were common currency.

³⁰Frederick Tupper, Jr., *The Riddles of the Exeter Book*, Introduction, xvii (Boston, Ginn, 1910). ³¹*Ibidem*, xxx.

³²William Bellamy (Boston, Houghton Mifflin Company, 1896).

³³These all occur in Chapters 42 and 43. ³⁴Chapter 153.

³⁵In the *Disputatio Pippini Cum Albino*. Compare W. Wilmanns, *Haupts Zeitschrift für Deutsches Altertum* 14:530-555.

³⁶For the text see A. Riese, *Anthologia Latina*, I, No. 481 (see note 24, above).

⁴⁰⁰On Vergil, *Eclogues* 6.42.

⁴⁰¹Pauly-Wissowa, under Hephaistos, 8.338-339.

⁴⁰²Servius on Vergil, *Aeneid* 12.200.

⁴⁰³Lucan 6.465-467.

⁴⁰⁴Pliny 2.140. Compare Seneca, *Hercules Oetaeus* 467-471.

⁴⁰⁵G. Wissowa, *Religion und Kultus der Römer*², 121 (Munich, Beck, 1912). See also Pauly-Wissowa, under Iuppiter, 10.1129-1130; C. O. Thulin, *Die Etruskische Disciplin*, Part 1, 121-122 (Göteborg, 1906). The verb *elicere* is used several times with *fulmen* as its object.

In order to 'elicit' from the divinities what portents sent by bolts or in any other manner had to be expiated Numa dedicated an altar to Iuppiter Elicius on the Aventine⁴⁰⁶. He learned from the imps Picus and Faunus, or, according to some accounts, from Jupiter himself, a charm for luring down lightning. By verbal subtlety he changed it from heads of men to sprats⁴⁰⁷.

We may well believe Pliny⁴⁰⁸ when he says that drawing down Jupiter was an extremely difficult undertaking. Tullus Hostilius made a mistake in the ceremony, as a result of which he and his whole household perished from the stroke of a thunderbolt⁴⁰⁹. Numa, however, did not suffer any ill consequences, because he employed the fire only in sacrifices to the gods⁴¹⁰.

Thé Etruscans seem to have been able to control even the direction and the course of thunderbolts. According to an old story, they used this means of killing a monster which was ravaging the territory around Volsinii⁴¹¹. They also terrified barbarians by causing bolts to fall upon them. In 408, when Alaric was besieging Rome, to Etruscan diviners who claimed they had driven an enemy away from another city by means of bolts an opportunity was given to do a similar service for Rome, but they failed⁴¹². They could not match the skill of their ancestors, whose reputation as masters of the lightning was so great⁴¹³ that some scholars have seriously questioned whether they did not anticipate Franklin⁴¹⁴.

The possibility of controlling the elements was but seldom questioned, so that, when Constantine was trying to restrict the activities of magicians, he made an exception of those who were endeavoring to avert hail and lightning⁴¹⁵.

In the ninth century Agobard, Bishop of Lyons, who wrote a lengthy treatise *De Grandine et Tonitruis*⁴¹⁶, said in his first sentence that almost all men, both distinguished and humble, urban and rustic, old and young, believed that hail and thunder could be caused at the will of man.

An interesting account of precise manipulation of the elements like pieces in a game is given by Marco Polo⁴¹⁷. He thus describes the abilities of the astrologers and magicians in the palace of the grand khan in the city of Sandu:

... if it should happen that the sky becomes cloudy and threatens rain, they ascend the roof of the palace where the grand khan resides at the time, and by the force of their incantations they prevent the rain from falling and stay the tempest; so that whilst, in the sur-

rounding country, storms of rain, wind, and thunder are experienced, the palace itself remains unaffected by the elements.

A peculiar method of controlling thunder is attributed to the Brahmans, who are said to have kept both thunder and winds in jars. This story was ridiculed by Eusebius⁴¹⁸.

WIELDERS OF THE BOLT

Since classical times the bolt has been so definitely associated with Zeus that we are inclined to forget that other gods wielded it. It was only after a struggle that Zeus attained his preeminence in this respect. Lucretius⁴¹⁹ speaks rather generally of Jupiter and the other gods as throwing fire. When Delphi was in danger from a detachment of Xerxes's army, thunderbolts crashed down upon that army⁴²⁰. Many of the invaders were killed and others fled in terror. These bolts were attributed, not to a specific god, but to the deities in general⁴²¹. Justinus⁴²² writes thus of the matter:

'Forthwith, just as if he were warring not merely with the Greeks, but with the immortal gods also, this band was entirely destroyed by storms and thunderbolts, that he might know that the strength of man is of no avail against the gods'.

Of the Etruscan gods nine were supposed to be able to throw bolts⁴²³. Amid groves and altars and shrines the Romans themselves had a number of deities whom they designated simply as *Tonantes* and *Feretrii*⁴²⁴.

There seems to have been a tradition that Zeus shared the thunderbolt with his two brothers. A painting on an amphora found at Chiusi depicts a triad of divinities, among whom is Poseidon, recognizable by his trident, holding a bolt in his left hand. The other gods clasp bolts in their right hands and lightning in their left⁴²⁵. In a discussion of this vase⁴²⁶ attention has been called to a passage in Pausanias⁴²⁷ in which Aeschylus is quoted as giving the name Zeus to the god that rules in the seas and also to the fact that Homer⁴²⁸ speaks of an 'under-earth' Zeus. It is quite possible, therefore, that this vase represents a Zeus-triad which controlled the bolt.

There are many indications that the trident of Poseidon was originally a thunder-weapon: Though the Greeks of historic times thought it was derived from the fishing-spear⁴²⁹, in the Homeric poems its employment is suggestive of the bolt. With it Poseidon stirs up storms and clouds⁴³⁰, shivers a rock⁴³¹, and, with Apollo and Zeus, makes the springs of Mount Ida well up, and demolishes impromptu fortifications of the Achaeans⁴³². Homer actually compares Poseidon's trident to the lightning⁴³³. It is not surprising, therefore, to find a statement that the correct analogue

⁴⁰⁶Livy 1.20.7. See also the text in connection with note 343, above.

⁴⁰⁷Plutarch, Numa 15. Compare Ovid, *Fasti* 3.339-343; Arnobius, *Adversus Nationes* 5.1. ⁴⁰⁸28.13.

⁴⁰⁹Pliny 2.140. See also Livy 1.31.8; Dionysius of Halicarnassus 3.35; Valerius Maximus 9.12.1.

⁴¹⁰Servius on Vergil, *Eclogues* 6.42.

⁴¹¹Pliny 2.140. Compare Seneca, *Hercules Oetaeus* 1991-1996.

⁴¹²Zosimus 5.41; Sozomenos, *Historia Ecclesiastica* 9.6.

⁴¹³See, for example, Seneca 2.32.1. For a good modern discussion see K. O. Müller, *Die Etrusker*, 176-180 (Stuttgart, A. Heitz, 1877). See also THE CLASSICAL WEEKLY 18.156-157.

⁴¹⁴See Daremberg et Saglio, *Dictionnaire des Antiquités Grecques et Romaines*, under Fulmen, 2.1356.

⁴¹⁵Codex Theodosianus 9.16.3.

⁴¹⁶Migne, *Patrologia Latina*, 104.147-158.

⁴¹⁷The Travels of Marco Polo, Book I, Chapter 57, pages 147-148 (see note 95, above).

⁴¹⁸Contra Hieroclem 24 (Migne, *Patrologia Graeca*, 22.829. See also 824).

⁴¹⁹6.387-389 quod si Iuppiter atque alii fulgentia divi terrifico quatunt sonitu caelestia templa et iaciunt ignem quo quioquest cumque voluptas....

⁴²⁰Herodotus 8.37. ⁴²¹Diodorus 11.14. ⁴²²2.12.

⁴²³Pliny 2.138. ⁴²⁴Pliny 2.140.

⁴²⁵Archäologische Zeitung, 1851, Plate XXVII.

⁴²⁶By Th. Panofka, *Kyzikos und Herakles*, *Archäologische Zeitung*, 1851, 306-314.

⁴²⁷2.24.4. ⁴²⁸Iliad 9.457. Compare Pausanias 2.24.4.

⁴²⁹C. Blinkenberg, 51-52 (see note 274, above).

⁴³⁰Odyssey 5.291-292. ⁴³¹Odyssey 4.506-507.

⁴³²Iliad 12.17-33. ⁴³³Iliad 14.385-386.

of the trident is "the group of lightning-shafts in the hands of the ancient Assyrian gods"⁴³⁴.

The hurling of the bolt was one of the prerogatives of Apollo⁴³⁵. To avenge the slaying of Glaucus by Zeus Apollo killed with a bolt the Cyclopes who had forged the fatal bolt used by Zeus⁴³⁶. When the Gauls under Brennus were bent upon sacking Delphi, the constant thundering and the frequent bolts, as well as the earthquakes by day, were attributed to the anger of the god who presided at that place⁴³⁷.

Of the goddesses Athena perhaps employed the bolt most frequently. She boasted that she alone knew the keys of the chamber where thunderbolts were kept⁴³⁸. She is sometimes represented as holding bolts in her right hand⁴³⁹. In the Troades of Euripides⁴⁴⁰ she says that Zeus promised to give her the thunderbolt to smite the Achaean ships returning from Troy and to set them on fire. Ajax was the most famous of her victims⁴⁴¹. Hera complained because Athena was privileged to use Jove's bolt to exact vengeance⁴⁴². In the Iliad⁴⁴³ both Athena and Hera are represented as thundering in honor of Agamemnon. The evidence indicates, therefore, that Athena was originally a thunder-goddess or weather-goddess⁴⁴⁴.

On occasion Juno⁴⁴⁵, Venus⁴⁴⁶, and even Diana⁴⁴⁷ wielded the bolt. Some authorities ascribed *manubiae* to Jupiter, Juno, and Mars⁴⁴⁸.

The list of wielders of the bolt might easily be increased, especially with the help of numismatic evidence⁴⁴⁹, but enough examples have been cited to show that Zeus, although he was the deity that punished impious mortals for imitating thunder and lightning, was not the only divine being who hurled the bolts. If it is true, as Servius says⁴⁵⁰, that the ancients thought that the bolt belonged to Zeus alone, he was very generous in lending it to fellow-deities in emergencies.

THUNDER AND LIGHTNING IN RELIGIOUS SERVICES

There is much evidence of the peculiar and profound religious reverence of the ancients for the bolt and its chief wielder, as may be shown by a hasty sketch of the various ways in which they appealed to this deity and his elements⁴⁵¹. In the invocation that precedes the Orphic Hymns, Thunders and Winds are addressed, together with a long list of gods and heroes and other

beings. When Greece lay bare and parched, Aeacus, learning from the Pythian oracle that the salvation of the land depended on his supplications, ascended a mountain and invoked Zeus, who at once thundered favorably and sent a torrent of rain⁴⁵².

Among the Orphic Hymns⁴⁵³ there are two called 'Thundering Zeus' and 'Lightning Zeus', which were to be accompanied by the burning of incense. The offering of incense to Zeus is mentioned by Ovid also⁴⁵⁴.

In the days of Appian the inhabitants of Seleucia by the sea were still worshiping thunder and singing its praises because of a portent of thunder when the city was being founded. They even regarded the bolt as a deity⁴⁵⁵.

Altars and temples of the god of thunder and lightning abounded, and, of course, sacrifices and festivals in his honor were not uncommon. Iuppiter Fulgurator had an altar on the Quirinal⁴⁵⁶, and Iuppiter Elicius had one on the Aventine⁴⁵⁷. Temples of Iuppiter Fulgur seem to have been numerous, for Vitruvius⁴⁵⁸ says that they should be hypaethral. As we have seen, Augustus erected a temple in honor of Iuppiter Tonans on the Capitoline⁴⁵⁹.

At Bathos in Arcadia, where, according to one tradition, the battle of the gods and the giants took place, sacrifices were offered to lightning, thunder, and storms⁴⁶⁰. At Iopolis, Seleucus sacrificed to Thunderbolt Zeus⁴⁶¹. For years the people of Tarentum offered sacrifice to the Thunderer on the anniversary of the day on which Zeus smote all Tarentines who had had a part in the disgraceful treatment of women, boys, and girls of a conquered town⁴⁶². The Antae and the Scлавени, tribes which dwelt across the Ister, believed that the maker of the lightning was lord of all things, and to him they sacrificed cattle and other victims⁴⁶³.

At Antandros there was a festival of Lightning Zeus which doubtless lasted several days, since reference is made to the conferring of an honorary crown on the first day of the celebration⁴⁶⁴. A prominent place was given to 'bolt-throwing Zeus' in the apparently protracted celebration described in a Tegean inscription which gives an Olympic victor list⁴⁶⁵.

In Phrygia, Zeus Bronton was ardently worshiped; there survive from Phrygia many inscriptions which record the fulfilment of vows to him⁴⁶⁶.

Such expressions as *ιερεὺς Διὸς*⁴⁶⁷ and *sacerdos <sic> dei Brontontis*⁴⁶⁸ seem to indicate that there were special priests of Zeus in his capacity as Thunderer. At all events the Pythaists in Athens kept watch

⁴³⁴J. R. Harris, Boanerges 14 (see note 250, above).

⁴³⁵Martianus Capella 1.7; Sophocles, Oedipus Rex 470; Apollodorus, Bibliotheca 1.9.26.

⁴³⁶Apollodorus, Bibliotheca 3.10.4; Diodorus 4.71.3.

⁴³⁷Pausanias 10.23. Compare 1.4.4.

⁴³⁸Aeschylus, Eumenides 827-828. See also Servius on Vergil, Aeneid 1.42.

⁴³⁹See Roscher, under Athene, 1.692. ⁴⁴⁰77-81, 92-94.

⁴⁴¹See, for example, Vergil, Aeneid 1.42-45; Hyginus, Fabulae 116; Apollodorus, Epitome 6.6.

⁴⁴²Vergil, Aeneid 1.42-45, and Servius on 42.

⁴⁴³1.45-46. ⁴⁴⁴See Roscher, under Athene, 1.675-678.

⁴⁴⁵Martianus Capella 1.67; Statius, Thebais 10.67-69; Accius as cited by Servius on Vergil, Aeneid 1.42. It is asserted by C. O. Thulin 33 (see note 405, above) that these passages are not sufficient to warrant one in ascribing thunder to the Italian Juno.

⁴⁴⁶Vergil, Aeneid 8.520-531. ⁴⁴⁷Martianus Capella 9.896.

⁴⁴⁸Servius on Vergil, Aeneid 8.429.

⁴⁴⁹See pages 32-33 of an article by Margaret C. Waites, The Deities of the Sacred Axe, American Journal of Archaeology 27 (1923), 25-56. Almost all her references to such deities are to a Catalogue of the Greek Coins of the British Museum. Many others may be found in that Catalogue.

⁴⁵⁰On Vergil, Aeneid 1.42 Antiqui Iovis solius putaverunt esse fulmen. . . .

⁴⁵¹I devoted a few paragraphs to the subject in THE CLASSICAL WEEKLY 18.155.

⁴⁵²Clemens Alexandrinus, Stromata 6.3. See also Diodorus 4.61.1-2; Apollodorus, Bibliotheca 3.12.6.

⁴⁵³Orphica 19-20 (in the edition of the Orphica, by E. Abel [Leipzig and Prague, 1885]).

⁴⁵⁴Fasti 5.301-302. ⁴⁵⁵Appian, Historia Romana 11.9.58.

⁴⁵⁶Corpus Inscriptionum Latinarum 6.377.

⁴⁵⁷Varro, De Lingua Latina 6.95. ⁴⁵⁸1.2.5.

⁴⁵⁹Pliny mentions the temple in 34.10 and 36.50. He also mentions (34.79) a statue of Iuppiter Tonans on the Capitoline.

⁴⁶⁰Pausanias 8.29.1.

⁴⁶¹Joannes Malalas 8.199 (Corpus Scriptorum Historiae Byzantinae).

⁴⁶²Athenaeus 522 D-F. ⁴⁶³Procopius 7.14.23.

⁴⁶⁴François Lenormant, Inscription Grecque d'Antandrus, Revue Archéologique, Nouvelle Série, 10 (1864), 49-51.

⁴⁶⁵Corpus Inscriptionum Graecarum 1.1513.

⁴⁶⁶See, for example, W. M. Ramsay, Inscriptions from Nacoleia, Journal of Hellenic Studies 3 (1882), 119-127, especially 123; Sepulchral Customs in Ancient Phrygia, *ibidem*, 5 (1884), 241-262.

⁴⁶⁷Corpus Inscriptionum Graecarum 3.4520.

⁴⁶⁸Corpus Inscriptionum Latinarum 6.733.

for lightning over distant Harma for three days and three nights in each of three successive months⁴⁶⁹. In the Etruscan discipline there were special priests called *fulguratores*⁴⁷⁰.

At Rome priests engaged in sacrifice were not allowed to wear clothes that had been struck⁴⁷¹. The *flaminica* who had heard thunder was not to engage in any work until she had appeased the gods⁴⁷².

CHRISTIAN AND PAGAN CONTROL OF THE BOLT COMPARED

In the first centuries of our era there was rather general agreement between Christians and pagans in the Graeco-Roman world that a supreme being controlled the elements⁴⁷³. A pagan who wished to become a Christian was not much troubled by theological meteorology. In the ages of weakening faith especially it was easy for a convert to transfer domination of the weather from Jupiter to the god of the Christians. Paganism regarded Jupiter as the god of lightning, thunder, the thunderbolt, rain, and clear weather⁴⁷⁴, but Minucius Felix⁴⁷⁵ is just as matter-of-fact in saying of God that '...in His works and in all the movements of the world we see His power ever present when there is thunder, lightning, or a bolt, and when it is clear'.

Ovid⁴⁷⁶ looks upon thunderings as intended to terrify human beings, and Plutarch says⁴⁷⁷ that thousands die merely from the fear of being killed. These natural terrors are increased manifold when bolts are regarded as messengers of punishment, an idea well represented by a passage in Juvenal⁴⁷⁸:

Hi sunt qui trepidant et ad omnia fulgura pallent,
cum tonat, exanimis primo quoque murmure caeli,
non quasi fortuitus nec venturum rabie sed
iratus cadat in terras et iudicet ignis.

Seneca believes⁴⁷⁹ that the wise forefathers of the Romans deliberately tried to frighten people into good behavior by creating fear of an armed and avenging justice. It is not insignificant that several names of weapons are applied to bolts also⁴⁸⁰.

⁴⁶⁹Strabo 9.2.11. See THE CLASSICAL WEEKLY 18.155.

⁴⁷⁰See, for example, Cicero, De Divinatione 2.109.

⁴⁷¹Festus 293 (Lindsay). ⁴⁷²Macrobius, Saturnalia 1.16.8.

⁴⁷³For interesting examples in the Old Testament see Exodus 9.23, 29-34; Job 28.26; Psalms 18.13-14, 97.4, 135.7, 144.6.

⁴⁷⁴Apuleius, De Mundo 37 Fulgurator et tonitrualis et fulminator etiam imbricitor et item dicitur serenator.

⁴⁷⁵32.4.

⁴⁷⁶Metamorphoses 1.55...humanas motura tonitrua mentes.

⁴⁷⁷Moralia 666 C.

⁴⁷⁸13.223-226. See also Vergil, Georgics 1.330-331; Suetonius, Caligula 51.

⁴⁷⁹2.42.3. Compare Cicero, De Divinatione 2.42; Plutarch, Moralia 665 A; Lydus 37 (item under date of April 20).

⁴⁸⁰For example, βέλεμος, Nonnus Dionysius 2.476, 6.212;

Διάβλητος...βέλεμος, *ibidem*, 2.511; βέλος, Aeschylus, Prometheus 358, 917; περοφόρον Διὸς βέλος, Aristophanes, Aves 1714; ἔγχος, *ibidem*, 1749; κήλον, Hesiod, Theogony 708, Homer, Iliad 12.280; οἰστός, Nonnus Dionysius 2.481; ὄπλα Διὸς, *ibidem*, 1.155; ἐκμήλον ὄπλον, Lucian, Timon 1; telum, Lucan 7.197; telum trisulcum, Ovid, Ibis 467. (In this note I have for convenience changed case and number of quoted Greek and Latin words to the nominative singular).—For a number of Greek names of weapons that were applied to bolts see Rheinisches Museum 60 (1905), 15.

Doubtless *sagitta* was used of the bolt. Statius, Thebais 4.294, speaks of the 'quivered Thunderer' (*pharetratus...Tonans*). The arrows which appeared in the hands of the statue of Veiovis, as mentioned by Aulus Gellius 5.12.11, are supposed to represent thunderbolts. See A. L. Frothingham, American Journal of Philology 38 (1917), 386-387. Compare David's prayer for the destruction of his enemies, in Psalms 144.6: "Cast forth lightning, and scatter them; shoot out thine arrows and destroy them". The Sicilian peasant swears by thunder and lightning with the formula "tuoni e saette". See Rheinisches Museum 60 (1905), 19.

A good example of the retributive use of the elements in the Old Testament is to be found in I Samuel 12.17-18:

Is it not wheat harvest today? I will call unto the Lord, and he shall send thunder and rain; that ye may perceive and see that your wickedness is great, which ye have done in the sight of the Lord, in asking you a king.

So Samuel called unto the Lord; and the Lord sent thunder and rain that day: and all the people greatly feared the Lord and Samuel.

Centuries later Tertullian⁴⁸¹ said to pagans, 'We worship one deity whom you all know naturally, at whose lightnings and thunders you tremble...' St. Cyril, Archbishop of Jerusalem, thus contrasted the attitude of Christians and that of the Manicheans⁴⁸²: 'God thunders and we all tremble, whereas they blaspheme. God lightens and all of us bend to the ground, while they utter impious words about the heavens'.

A contemporary illustration of the use of the bolt as a weapon is to be found in the novel Black April⁴⁸³:

A crowd of people were around the burning tree, and others were coming. All were talking excitedly. God must have his eye on April to aim a thunderbolt so close to his house. He had a narrow escape. His house might catch fire yet, for pieces of burning limbs were falling, and water could not put out fire started with lightning.

In antiquity many offences called down the vengeance of the thunderbolt. Aesculapius was struck dead because Zeus feared that he might teach mankind the art of healing⁴⁸⁴. Salmoneus suffered a similar penalty for impiety⁴⁸⁵. Capaneus, attacking a gate of Thebes, was smitten for comparing the lightning to mere mid-day heat⁴⁸⁶. Amulius was killed for venturing to imitate the lightning and the thunder of Zeus⁴⁸⁷. Most of the Autarienses, who joined the Cimbri in an expedition bent upon pillaging the temple at Delphi, were destroyed by storm, hurricane, and lightning before they had time to commit the sacrilege⁴⁸⁸.

In view of such examples and scores of others that might be cited, it is hard to understand how a Rhodian emissary could say to the Romans, in 167 B. C.⁴⁸⁹, 'For some chide even the gods with rather bold words and we have never heard that anyone has been struck with a bolt for that reason'.

A modern example of the use of the bolt to punish irreverence is to be found in The Invisible World, by Bishop Joseph Hall⁴⁹⁰:

A Master of Philosophy, travelling with others on the way, when a fearful Thunderstorm arose, check'd the Fear of his Fellows, and discours'd to them of the Natural Reasons of that Uproar in the Clouds, and those sudden Flashes wherewith they seem'd (out of

⁴⁸¹Ad Scapulam 2.1.

⁴⁸²Catechesis 6.34 (Migne, Patrologia Graeca, 33.600).

⁴⁸³Page 261 (<New York>, Grosset and Dunlap, 1927).

⁴⁸⁴Apollodorus, Bibliotheca 3.10.4. Compare Vergil, Aeneid 7.772-773; Cicero, De Natura Deorum 3.57.

⁴⁸⁵See, for example, Diodorus 4.68.

⁴⁸⁶Aeschylus, Septem Contra Thebas 430-446.

⁴⁸⁷Zonaras 7.1. See also THE CLASSICAL WEEKLY 18.157.

⁴⁸⁸Appian, De Rebus Illyricis 4. Compare Propertius 3.13.51; Justinus 28.8.10-14.

⁴⁸⁹Livy 45.23.19. Euripides (Cyclops 320) makes Cyclops say that he does not fear the bolt of Zeus.

⁴⁹⁰See The Works of the Right Reverend Father in God, Joseph Hall, Lord Bishop of Norwich, 2.403 (London, 1738). The passage is quoted, in somewhat altered form, by W. E. H. Lecky, History of European Morals from Augustus to Charlemagne, 1.360 (1891 edition, New York, Appleton).

the ignorance of Causes) to be too much affrighted; in the midst of his philosophical Discourse, he was struck dead with that dread Eruption which he slighted: What could this be but the Finger of that God, who will have his works rather entertain'd with Wonder and Trembling, than with curious Scanning?

Pagans of antiquity knew that Zeus could be induced to withhold his hand⁴⁹¹, but narrow escapes from being hit were, I believe, generally regarded by the ancients as due merely to luck or good fortune, not to the special favor of Zeus, although it is true that many inscriptions were set up to express thanks for salvation⁴⁹². Augustus, who had barely missed being hit during his campaign against the Cantabrians, erected a temple to Iuppiter Tonans as an expression of his gratitude⁴⁹³.

The Christians, however, were inclined to regard similar escapes as nothing short of miraculous and as due to Providence. According to one account of the celebrated battle of the Romans with the Quadi, God terrified the barbarians with thunderbolts and refreshed the Romans with rain⁴⁹⁴. Gregory of Tours⁴⁹⁵ tells how a thunderstorm which did much damage in a certain community wrecked the interior of a Church, but left unharmed all persons within it, thanks to the guardianship and the merit of a martyr. In comparatively recent times Increase Mather devoted to providential escapes from lightning an entire chapter of his book on Remarkable Providences Illustrative of the Earlier Days of American Colonisation⁴⁹⁶.

ANCIENT RECOGNITION OF THE UNSCIENTIFIC CHARACTER OF POPULAR WEATHER LORE

In spite of the prevailing ignorance of the nature and the significance of thunder and lightning, a few of the ancients managed to rise above the popular notions of their day. Lucretius explains⁴⁹⁷ that the fires of the bolts are not signs of wind and rain. He recognizes⁴⁹⁸ that a skipper's prayers cannot calm a tempest or bring a return of clear weather. Cyrus the Elder thinks⁴⁹⁹ that those who have not learned how to steer have no right to expect their prayers to save ships when they take the helm. Ovid⁵⁰⁰ is just as sure of the uselessness of praying for rain.

⁴⁹¹See Ovid, *Fasti* 5.301-302 *Saepe Iovem vidi, cum iam sua mittere vellet fulmina, tunc dato sustinuisse manum.*

⁴⁹²See, for example, *Corpus Inscriptionum Graecarum* 3.4501 (Syria); 2.3446 (Lydia).

⁴⁹³Suetonius, *Augustus* 29.3; Dio 54.4.2. See also *Monumentum Ancyranum* 19; Pliny 34.79, 36.50. In a somewhat similar manner a *lectisternium* was set up in a temple on behalf of the safety of Hadrian, who had evidently had a narrow escape from being struck by thunderbolts. See *Corpus Inscriptionum Graecarum* 1.4501.

⁴⁹⁴Dio 72.9.5 (The Loeb Classical Library 9.30-31). See *THE CLASSICAL WEEKLY* 18.164-165.

⁴⁹⁵*De Miraculis Sancti Iuliani* 2.27 (Migne, *Patrologia Latina*, 71.817).

⁴⁹⁶Chapter 3 (London, J. R. Smith, 1856).

⁴⁹⁷6.222 *ignis enim sunt haec non venti signa neque imbris.*

⁴⁹⁸5.1226-1232. ⁴⁹⁹Xenophon, *Cyropaedia* 1.6.6.

⁵⁰⁰*Remedia Amoris* 219.

Many passages show that it was a commonplace bit of knowledge among scientific men that thunder and lightning were caused by the collision and struggling of clouds driven on by winds⁵⁰¹. In the effort to help the simple-minded and the superstitious to remove the phenomena from the realm of the supernatural to the natural, they explained that friction of clouds generated fire in the same way as does the friction of stones or wheels or trees in a forest or wood in general⁵⁰². After a bolt had fallen into a camp of Pericles and utterly terrified his soldiers, he took stones and struck a spark from them, explaining that bolts were generated in the same way by the clashing of clouds⁵⁰³. The noise of thunder has been compared to that caused by the bursting of a bladder⁵⁰⁴ or by the clapping of hands⁵⁰⁵.

Manilius asserted⁵⁰⁶ with confidence that reason or science had taken away from Jupiter the thunderbolt and the power of thundering. Manilius was merely the spokesman for the learned. This idea never reached the masses⁵⁰⁷. When Jupiter died in the conflict with Christianity, the people merely transferred the bolt. The striking of a building by lightning is still "an act of God".

MODERN REFERENCES

The following references may be found useful for a hasty comparison of modern and ancient weather lore of thunder and lightning: F. G. Aflalo, *Fishermen's Weather*, 205-227⁵⁰⁸; H. H. C. Dunwoody, 80-82 (see note 3, above); *Handwörterbuch des Deutschen Aberglaubens*⁵⁰⁹, under *Blitz*, *Donner*; Richard Inwards, *Weather Lore: A Collection of Proverbs, Sayings, and Rules Concerning the Weather*⁵¹⁰, 141-144; C. Swainson, *A Handbook of Weather Folk-Lore*, 214-217⁵¹¹.

In this paper, as in previous articles, I have tried to give by quotation or citation all the weather signs which I could find, but in the periphery of the subject, in which there is a shading off to a wealth of material not strictly connected with the weather, I have endeavored to be merely selective.

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⁵⁰¹See Stobaeus, *Eclogae Physicae* 1.29 (see the Wachsmuth-Hense edition, 1.231-238 [compare note 121, above]).

⁵⁰²Lucretius 6.161-163; Pliny 2.113; Seneca 2.22.1; Isidorus, *Origines* 13.9.1.

⁵⁰³Frontinus, *Strategemata* 1.12.10.

⁵⁰⁴Aristophanes, *Nubes* 403-407; Lucretius 6.130-131; Pliny 2.113; Isidorus, *Origines* 13.8.2.

⁵⁰⁵Seneca 2.27.3.

⁵⁰⁶*Astronomicon* 1.104 <ratio> eripuit... Iovi fulmen viresque tonanti.

⁵⁰⁷In the early part of the Middle Ages the masses conferred the bolt on magicians. See the text connected with note 416, above.

⁵⁰⁸London, A. and C. Black, 1906.

⁵⁰⁹See end of note 199, above.

⁵¹⁰London, Elliot Stock, 1898.

⁵¹¹Edinburgh and London, Blackwood and Sons, 1873.



Greek and Roman Weather Lore of the Sea: Est et aquarum signification: Pliny 18.359

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Source: *The Classical Weekly*, Vol. 27, No. 1 (Oct. 2, 1933), pp. 1-6

Published by: [Classical Association of the Atlantic States](#)

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The Classical Weekly

VOL. XXVII, No. 1

MONDAY, OCTOBER 2, 1933

WHOLE No. 718

GREEK AND ROMAN WEATHER LORE OF THE SEA¹

Est et aquarum significatio.—Pliny 18.359².

THE SEA A SACRED DOMAIN NOT TO BE VIOLATED BY MAN

In classical literature there are many allusions to the temerity and the impiety of those who first dared to embark upon the sea. Man, these allusions state or imply, is a creature of the land; upon it the gods ordained that he should live. For his well-being the water had been separated from the earth. In the Golden Age man kept within his own province and did not engage in seafaring. The first boats that put to sea were intruders upon the domain of the almighty powers and risked the direst retribution³. 'In vain', exclaims Horace⁴, 'did a provident god sunder the land from the alien ocean if, despite his will, impious barks bound over seas not intended to be coursed'.

The impiety of trespassing upon the sea is vividly pictured by Albinovanus Pedo⁵:

... Di revocant rerumque vetant cognoscere finem
mortales oculos; aliena quid aequora remis
et sacras violamus aquas divumque quietas
turbamus sedes?

Such ideas were literary conventions among Greek and Roman writers, but they had been inherited from a time when they were invested with reality. A fair analogy is the awe which some untutored persons manifest on seeing another divine domain invaded, the air. In Julia Peterkin's novel, *Black April*⁶, Maum Hannah cries out as she hears an airplane "so high that

¹I have published in THE CLASSICAL WEEKLY several other articles on weather lore, as follows: An Animal Weather Bureau, 14.89-93, 97-100; The Folk Calendar of Times and Seasons, 16.3-7; The Plant Almanac and Weather Bureau, 17.105-108; Magic and the Weather in Classical Antiquity, 18.154-157, 163-166; The Classical Astral Weather Chart for Rustics and Seamen, 20.43-49, 51-54; Greek and Roman Weather Lore of the Sun and the Moon, 22.25-31, 33-37; Clouds, Rainbows, Weather Galls, Comets, and Earthquakes as Weather Prophets in Greek and Latin Writers, 23.2-8, 11-15; Greek and Roman Weather Lore of the Winds, 24.11-18, 18-24, 25-29; Classical Weather Lore of Thunder and Lightning, 25.183-192, 200-208, 212-216.

²The following abbreviations will be used in the notes below: *Astrol. Graec.* = *Catalogus Codicum Astrologorum Graecorum* (Brussels, H. Lamartin, 1898-); *Breysig* = A. Breysig, *Germanici Caesaris Aratea Cum Scholiis* (Berlin, Reimer, 1867); *Daremberg-Saglio* = *Dictionnaire des Antiquités Grecques et Romaines*, by Charles Daremberg and Edmond Saglio (Five Volumes. Paris, Hachette, 1881-1919); *Gruppe* = O. Gruppe, *Griechische Mythologie und Religionsgeschichte* (Munich, Beck, 1906); *Migne*, P. G. = *Migne, Patrologia Graeca*; *Migne*, P. L. = *Migne, Patrologia Latina*; *Pauly-Wissowa* = *Real-Encyclopädie der Classischen Altertumswissenschaft*, new edition, by Georg Wissowa, Wilhelm Kroll, and Kurt Witte (Stuttgart, Metzler, 1894-); *Pliny* = *Pliny, Naturalis Historia*; *Roscher* = Wilhelm Heinrich Roscher, *Ausführliches Lexicon der Griechischen und Römischen Mythologie* (Leipzig, Teubner, 1884-1925); *Th.* = *Theophrastus*.

The letters A and B after references to THE CLASSICAL WEEKLY indicate the first and second columns respectively of the page.

³Copious references on the subject are to be found in Kirby F. Smith, *The Elegies of Albius Tibullus*, 246 (New York, The American Book Company, 1913).

⁴Horace, *Carmina* 1.3.21-24. Compare Greek Anthology 9.29. ⁵As quoted by Seneca, *Suasoriae* 1.15. Compare Valerius Flaccus, *Argonautica* 1.627-628 *Hoc erat illicitas temerare rudentibus undas, quod nostri timuere patres*.

⁶117 (New York, Grosset and Dunlap, 1927).

its buzz was hardly more than the hum of the wind":

"Pray, chillen, pray! Talk wid Jedus! I too sorry to see you dis mawnin'!" She shook her old head, and shouted again: "Gawd don' like mens to go up in de elements! Dis is His day, too! Pray, chillen, pray! Do, Jedus, hab mussy on dem. I hope dey ain' none o' we white folks."

It is with awe that Pliny the Elder⁷ reflects upon the temerity of man in adding entire trees (i. e. masts) and sails to ships in order to catch winds and squalls. Not content to die upon the land, inventors were always seeking new ways of meeting death. In Seneca's opinion⁸, no matter how useful and necessary the services are which the winds perform, these blessings do not compensate for the destruction which they bring upon the nations of the world by driving ships of war.

There was doubtless a time when Greeks and Romans thought such uses of the wind outright sacrilege. It is hard for a machine-minded age to appreciate the depth of such feelings, but as recently as the introduction of winnowing machines there existed similar religious objections to the mechanical employment of the wind. In Sir Walter Scott's novel, *Old Mortality*⁹, a vassal who, with her son, is threatened with dismissal from a barony, thus airs a grievance:

... And since your leddyship is pleased to speak o' parting wi' us, I am free to tell you a piece o' my mind in another article. Your leddyship and the steward hae been pleased to propose that my son Cuddie suld work in the barn wi' a new-fangled machine for dighting the corn frae the chaff, thus impiously thwarting the will of Divine Providence, by raising wind for your leddyship's ain particular use by human art, instead of soliciting it by prayer, or waiting patiently for whatever dispensation of wind Providence was pleased to send upon the sheeling hill.

These are the words of a novelist, but there is every reason to take them at their face value. Sir James Y. Simpson, a Scotch physician who was the first to use chloroform in medical practice, thus pictures religious hostility to 'fanners'¹⁰:

... Some of the more rigid sects of Dissenters loudly declaimed against the employment of any such machinery. "Winds (they argued) were raised by God alone, and it was irreligious in man to attempt to raise wind for the aforesaid purpose for himself, and by efforts of his own." Mr. Gilfillan, the well-known Scottish poet, has furnished me with evidence of one clergyman debarring from the communion of the Lord's Supper those members of the flock who thus irreverently used the "Devil's wind" (as it was termed). And such sentences, I believe, were not uncommon

⁷19.5-6.

⁸*Naturales Quaestiones* 5.18.3-14.

⁹Chapter 7.

¹⁰See a pamphlet called *Answer to the Religious Objections Advanced Against the Employment of Anaesthetic Agents in Midwifery and Surgery*, reprinted in a work entitled *Anaesthesia, Hospitalism, Hermaphroditism, and a Proposal to Stamp out Small-pox and Other Contagious Diseases*, by Sir James Y. Simpson, edited by Sir W. G. Simpson, 42-55 (New York, D. Appleton and Co., 1872). The passage quoted above is on page 52 of the latter work.

within the memory of some aged members of the present generation¹¹.

THE GODS AND WEATHER BY SEA IN THE GREEK HEROIC AGE

In view of their fear of the sea and of the elements that raged upon them, it is not strange that the ancients took every possible precaution as they braved the terrors of the deep. In classical accounts of travel and adventure by sea during the heroic days of the Trojan expedition, the return of Ulysses, and the quest of Aeneas for a new home in Hesperia offerings are already well established as a means of trying to secure favorable winds and safety from storms¹².

The earliest item of Greek weather lore is to be found, I believe, in the story of Nereus's stopping the ship of the fleeing Paris in order to prophesy the doom of Troy. To accomplish his purpose Nereus caused a calm¹³. This is, of course, but a humble forerunner of the famous calm with which Artemis long delayed the Greek fleet at Aulis when she was angry at Agamemnon¹⁴. Some sources say that Agamemnon killed a goat which was sacred to Artemis and that he had made boasting comparisons between his own marksmanship and that of the goddess¹⁵. It is also stated that Artemis was vengeful because in the year in which Iphigenia was born Agamemnon had vowed to sacrifice the most beautiful thing that might come into the world during that year, but had failed to keep his vow¹⁶. According to a peculiar story preserved by Propertius¹⁷, the calm beset the fleet when it was being detained by the loss of Argynnus, a youth whom Agamemnon loved.

The *Cypria*¹⁸ states that Agamemnon offended Artemis during the second mustering of the fleet at Aulis¹⁹. In this account it was the shooting of a deer²⁰ which caused Agamemnon to become boastful; Artemis, the account continues, sent stormy winds to prevent the departure. Ovid²¹ says that the expedition was kept waiting by lack of winds or by adverse winds.

Whatever offence or neglect may have provoked Artemis to anger, Calchas declared that the only way

to propitiate her was to sacrifice Iphigenia²². When the fateful moment was at hand, Artemis substituted a hind for the maiden²³, or else changed her into a bear, or a bull, or a stag, or an old woman²⁴.

The most circumstantial account of this incident is given by Dictys Cretensis²⁵. When Menelaus and others were preparing the final rites for Iphigenia, the day became dark and cloudy. It began to thunder and lighten. The earth and the sea were convulsed. Much rain and hail fell²⁶. The participants in the ceremony wavered between continuing and desisting. In the midst of their perplexity a voice told them that the goddess spurned such a sacrifice and that they should offer up a substitute. Thereupon the winds and the lightnings began to lose their power.

Some writers, however, represent Iphigenia as having actually been slain²⁷. This was doubtless in accord with an older, unrefined version, which was used by some authors who found it more effective for their immediate needs²⁸. Among them is Vergil²⁹:

Sanguine placastis ventos et virgine caesa
cum primum Iliacas, Danaï, venistis ad oras. . . .

Aeschylus³⁰, who says that adverse winds detained the Greeks, regards the slain Iphigenia as a charm against winds that blew from Thrace³¹.

It is said that, when a fair wind did finally spring up, each man sacrificed to Artemis whatever animals he happened to have, whether male or female³². On the day on which the Greeks embarked Zeus thundered on the right, a sign auspicious for the success of the expedition³³.

The divine displeasure against the departure of the expedition from Greece against Troy has a somewhat close analogue in the life of William the Conqueror. When a favorable breeze failed for several days to spring up after he was ready to embark for England, his soldiers began to mutter and to assert that a man who wished to bring a foreign country under his control was crazy, and that God was manifesting disapproval by withholding the winds. They recalled that in the same manner William's father had been hindered from sailing. It was fated, they said, for members of that family, aspiring to things beyond their strength, to find God opposed to them³⁴.

¹¹An example of hostility to winnowing fans is recorded by W. Gregor, Notes on the Folk-Lore of the North-East of Scotland (Publications of the Folk-Lore Society, 7 [1881], 183).

¹²References will be given in appropriate places.

¹³Horace, Carmina 1.15.1-5.

¹⁴For references to the withholding of the winds by Artemis see the scholium on Euripides, Orestes 658, and Tzetzes on Lycophron 183. More picturesque accounts of the withholding of winds by powers divine are given in the text with which notes 34, 62, 249 below, are connected. See also the quotation from Drayton, The Moore-Calf, given below, at the bottom of page 4, column 1.

¹⁵Scholium on Iliad 1.108; Dictys Cretensis 1.19.

¹⁶Euripides, Iphigenia in Tauris 19-25. ¹⁷3.7.21-24.

¹⁸The *Cypria*, as summarized by Proclus, Chrestomathia, may be consulted conveniently in T. W. Allen, Homeri Opera 5.104 (Oxford: At the Clarendon Press, 1912), and in H. G. Evelyn-White, Hesiod and the Homeric Hymns, 492 (The Loeb Classical Library).

¹⁹There are other passages which are said to apply to a second assembling of the fleet at Aulis. Compare Roscher (see note 2, above), under Agamemnon, 1.93, and Gruppe, 669-670 (see note 2, above).

²⁰Other passages in which it is a deer that is killed are Callimachus, Hymn to Artemis 3.262-263; Sophocles, Electra 563-574 (see also 373-374); Scholium on Euripides, Orestes 658; Hyginus, Fabulae 98. In the Electra the deer is a stag, and the life of Iphigenia is in quittance for the life of the stag. There is mention of the slaying of the deer, but not of the boasting, in Servius, on Vergil, Aeneid 2.116, and in Hyginus, Fabulae 261.

²¹Metamorphoses 13.183.

²²Scholium on Iliad 1.108; *Cypria* (see note 18, above); Euripides, Iphigenia in Tauris 16-24. In the scholium on Euripides, Orestes 658, and in Vergil, Aeneid 2.114-119 the Delphic oracle makes this pronouncement. Evidently the unblemished hecatombs of Iliad 2.305-306, which had been made to the gods in general, had been offered during the first assembling of the fleet. The Chrestomathia (see note 18, above) mentions sacrifices during the first gathering of the fleet.

²³Scholium on Iliad 1.108; Euripides, Iphigenia at Aulis 1587, Iphigenia in Tauris 28, 783; Pausanias 9.19.6; Ovid, Metamorphoses 12.28-34; Dictys Cretensis 1.22.

²⁴Antoninus Liberalis 27; Tzetzes on Lycophron, Alexandra 183. Lycophron says (Alexandra 183-184) that a heifer was substituted; the scholium on Aristophanes, Lysistrata 645 mentions the sacrifice of a bear. ²⁵1.21.

²⁶The storm is here explained as a *signum divinum*, but storms are traditional accompaniments of death. See THE CLASSICAL WEEKLY 25.205-206.

²⁷E. g. Pindar, Pythia 11.23. See also Ovid, Metamorphoses 12.28-34. ²⁸E. g. Lucretius 1.84-111.

²⁹Aeneid 2.116-117. But compare Servius on 2.116 *Virgine caesa non vere, sed ut videbatur. Et sciendum in sacris simulata pro veris accipi*. . . .

³⁰Agamemnon 149-150, 192. Compare also Proclus, Chrestomathia (in Allen, 5.104, Evelyn-White, 492; see note 18, above).

³¹Agamemnon 1417-1418; compare 214.

³²Pausanias 9.19.7. ³³Homer, Iliad 2.350-353.

³⁴William of Malmesbury, Gesta Regum Anglorum, Liber III, Section 238.

The Greeks finally reached Troy, but, when they experienced difficulty in taking the city by force, they resorted to subterfuge. They dispatched Sinon to their enemies in the guise of a fugitive³⁵. He informed the Trojans that the Greeks had wearied of the siege and were desirous of withdrawing. The oracle of Apollo had told them, however, that their return must be purchased by a life, just as their setting out had been effected in this way³⁶. He himself, Simon added, had been selected for sacrifice and for that reason had sought refuge among the Trojans. The superstition that the winds could be controlled and appeased by the offering of victims paved the way for the downfall of Troy.

On the return voyage the Greek fleet stopped at the Chersonesus, where the ghost of Achilles appeared and forbade the continuance of the journey. The ghost demanded the sacrifice of Polyxena. As she was slain, Talthibius prayed to his father to be kindly and to grant that the prows and the moorings might be loosed, that the fleet might have a safe return³⁷.

Two children were sacrificed by Menelaus when he and Helen were being held in Egypt by unfavorable weather³⁸.

Idomeneus had similar beliefs, for, when he was caught in a storm as he was returning to Crete after the destruction of Troy, he vowed to sacrifice to Neptune whatever should first meet him in Crete. His son encountered him first, but he fulfilled his vow³⁹. In Homeric Hymns 33 there is described the sacrifice of white lambs to the waters made by the crew of a ship during a storm.

To show gratitude for his escape from the storm which fell upon the Greeks as they were on their way home Diomedes dedicated to Seafaring (*Epibaterios*) Apollo a temple within the sacred precinct of Hippolytus at Troezen⁴⁰. As a charm against bad weather Agamemnon consecrated the rudder of his ship in the shrine of Artemis at Samos⁴¹.

The Homeric Poems attribute to several deities and magicians power to control the weather upon the deep⁴². In this domain Zeus seems to direct the elements less than upon land, possibly because of the activities of other gods. He does, however, stir up storms and disturb the waters⁴³. It was Zeus to whom Helios appealed for vengeance against Ulysses and his companions after the loss of his sacred cattle. In answer Zeus caused a severe storm⁴⁴. The assembler of clouds sends Boreas upon the main⁴⁵, but he is often a god of

fair winds and favoring breezes⁴⁶. Sacrifices were made to him and to all the other gods by persons putting out to sea⁴⁷. It is not surprising that in later times a temple was built for *Zeus Oëpius*, 'Zeus of Fair Winds'⁴⁸, on the Asiatic side of the Bosphorus, for the convenience of those who sailed to and from the Euxine Sea. Zeus also stills the sea⁴⁹.

A brother of Zeus, Poseidon, incites storms, especially winds⁵⁰, to fury⁵¹. To him Ulysses sacrifices thighs of bulls for a continuance of favorable breezes⁵². He is thus addressed in the Homeric Hymns⁵³:

Hail, Poseidon, Holder of the Earth, darkhaired lord! O blessed one, be kindly in heart and help those who voyage in ships!

While he was weather-bound on the island where Helios pastured his cows, Eurylochus vowed to Helios a temple rich in gifts if he should grant the Greeks a safe return to Ithaca⁵⁴.

Hera, too, arouses squalls upon the boisterous main⁵⁵. Athena binds the courses of the winds and makes them cease, except Boreas, which carries Ulysses to the land of the Phaeacians. She calms the sea in front of Ulysses as he swims⁵⁶. She can also cause winds and mighty waves⁵⁷, but she knows how to send favorable breezes⁵⁸. At the petition of Telemachus she alights upon his ship⁵⁹.

In the Homeric Hymns the capture of Dionysus by Tyrsenian pirates is described. The steersman is sure that the prisoner is a god, Zeus, or Apollo, or Poseidon, and advises that he be released lest he stir up terrible winds and a rushing storm⁶⁰.

Aeolus, to whom Zeus has given a mandate over the winds⁶¹, binds them in a sack⁶², but releases Zephyr for Ulysses⁶³. Apollo⁶⁴, Athena⁶⁵, Calypso⁶⁶, and Circe⁶⁷ are all mentioned as sending favorable winds. Sometimes a god unnamed or the gods in general bestow fair winds⁶⁸. When Ulysses and his companions reach

⁴⁰Odyssey 3.289, 5.176, 15.475; Iliad 14.19. Compare Homeric Hymns 3.427, 433; Aeschylus, Suppliants 594; Apollonius Rhodius 2.525; Greek Anthology 12.53; Corpus Inscriptionum Graecarum II, No. 3797, line 1 (edited by August Boeckh, Berlin, Reimer, 1843).

⁴¹Iliad 9.357-358; Odyssey 4.472-480.

⁴²See Gruppe, 834, note 10, and Geographi Graeci Minores, I.140, 568, 569.

⁴³Odyssey 3.158. ⁵⁰Odyssey 5.291-296.

⁵¹Odyssey 5.292, 11.400, 407, 24.110.

⁵²Odyssey 3.178-183. For other sacrifices to Poseidon see Odyssey 3.6, 10.571-574, 13.181-182. In Iliad 23.194-195 Achilles prays to Boreas and Zephyr and promises sacrifices.

⁵³Hymn 22, to Poseidon. I give H. G. Evelyn-White's translation, in The Loeb Classical Library.

⁵⁴Odyssey 12.325-326, 345-347.

⁵⁵Iliad 15.26-27. See also the Cypria, as summarized by Proclus, Chrestomathia, in Allen, 5.103, Evelyn-White, 490 (see note 18, above).

⁵⁶Odyssey 5.383-386. ⁵⁷Odyssey 5.108-109.

⁵⁸Odyssey 2.420, 15.292. In Euripides, Iphigenia in Tauris 1487-1488, Athena commands the winds to take Orestes back to Athens.

⁵⁹Odyssey 2.262-267.

⁶⁰Hymn 7, to Dionysus, especially 17-24.

⁶¹Odyssey 10.21. In Vergil, Aeneid 1.50-63 Aeolus is king of the winds. Vergil is in agreement with Polybius, as quoted by Strabo 1.2.15.

⁶²For a humorous reference to the bag of winds see the Greek Anthology 9.484.

⁶³Odyssey 10.19-27. The squall caused by the opening of the bag of winds is described in 10.47-55. The activities of Aeolus are mentioned in note 86, below.

⁶⁴Iliad 1.479.

⁶⁵Odyssey 2.420-421, 15.292. The scholium on Odyssey 13.259 says that Athena caused the storm which Idomeneus encountered. See the text connected with note 39, above.

⁶⁶Odyssey 5.167, 288, 7.266. ⁶⁷Odyssey 11.7, 12.149.

⁶⁸Odyssey 3.183, 4.520, 585-586, 15.34-35, 17.148-149; Iliad 7.4-5. Doubtless in some of these passages the god is Zeus.

³⁵Aeneid 2.57-198.

³⁶Aeneid 2.108-121.

³⁷Euripides, Hecuba 538-541. See also 109-111, 1289-1292; Ovid, Metamorphoses 13.399-448. In Odyssey 3.159-160 it is recorded that sacrifices for a safe return had been made at Tenedos.

³⁸Herodotus 2.119.

³⁹Scholium on Homer, Odyssey 13.259; Servius on Vergil, Aeneid 3.121, 11.264.

⁴⁰Pausanias 2.32.2.

⁴¹Callimachus, Hymns 3.228-232. In The Loeb Classical Library edition of Callimachus (80) A. W. Mair comments as follows: "The ἀπλωτα is sometimes described as a storm, sometimes as a dead calm".

⁴²Many Homeric references to Zeus and the weather have been collected by A. Roussel, La Religion dans Homère, 310-317 (Paris, Maisonneuve, 1914).

⁴³Odyssey 5.303-305, 12.313-315.

⁴⁴Odyssey 12.377-425, especially 405-406.

⁴⁵Odyssey 9.67. Compare Iliad 2.145-146.

the island of the Sirens, the winds cease and a dead calm ensues. A 'daimon' also stills the waves⁶⁹.

Reversing the direction of the wind is another feat performed by Homeric gods. When Proteus is forced to tell the fate of the Greeks whom Nestor and Menelaus had left at Troy, he says that they had encountered a storm at Cape Malea, but that, after they had rounded this dangerous place, the gods had changed the direction of the wind and the Greeks had arrived home⁷⁰.

There is a marvelous tale in the Homeric Hymns⁷¹ of divine manipulation of the winds. In the guise of a dolphin Phoebus Apollo leaped into a ship which Cretans were sailing to sandy Pylos. In fear of the portent the crew sat still and made no effort to handle the vessel, but it sped by their destination with a strong south wind behind it. At Taenarum, where they did finally try to stop the ship, it failed to obey the rudder and sailed on. It continued up the west coast of the Peloponnesus, with Apollo readily guiding it by the breeze. When they were opposite the Corinthian Gulf, the west wind, blowing clear and strong by the counsel of Zeus, enabled Apollo to bring it to Crisa, the haven he had appointed for it.

So many of the deities of heroic days had something to do with the wind that it seems worth while to add the following quotation⁷² to this section of my paper:

... Die meisten dieser göttlichen Wesen werden auch im späteren Kult um gute Winde und glückliche Fahrt angerufen: Zeus z. B. als Euanemos, Urios, Apobaterios, Limenoskopos, Apollon als Embasios, Ekbasios und Asgelatas, Athena als Anemotis, wahrscheinlich auch als Aithra und Aglauros. Gelegentlich werden aber auch andere Gottheiten teils in der Dichtung wie Rheia, Aphrodite, Hera als Verleiher guter oder böser Winde bezeichnet, teils im späteren Kultus als solche angerufen; ja es ist die Macht über Wind und Wetter geradezu ein allgemeines Kennzeichen göttlichen Wesens, das sogar niederen Gottheiten, wie Kirke oder Kalypso, und in den Dichtungen, die einen Einfluss der Verstorbenen auf die Erde nicht grundsätzlich verwerfen, auch Heroenseelen zukommt. . . .

Modern lore attributes somewhat similar powers to witches. In *The Pirate*⁷³, by Sir Walter Scott, "the mistress of the potent spell" could "change the wind by pulling her curch on one side, as King Erick used to do by turning his cap".

The witch in Michael Drayton's poem, *The Moone-Calf*, has similar magical control of the winds:

She could sell windes to any one that would^{74a},
Buy them for money, forcing them to hold
What time she listed, tye them in a thrifd,
Which ever as the Sea-farer undid
They rose or scantled, as his Sayles would drive,
To the same Port whereas^{74b} he would arive.

⁶⁹Odyssey 12.168-169. ⁷⁰Odyssey 4.492-520.
⁷¹3, especially 408-409, 420-421, 427, 433. In giving the numbers of verses I use the edition of *The Homeric Hymns* by T. W. Allen and E. E. Sikes (London, Macmillan and Company, 1904). Professor Knapp calls my attention to a striking case of change of wind in Vergil, *Aeneid* 3.682-689.

⁷²Gruppe, 834-835 (see note 2, above).

⁷³Chapter 7.

^{74a}To me this comma seems impossible. Dr. McCartney tells me he gives the quotation from the most recent edition of Drayton—*The Works of Michael Drayton*, Edited by J. William Hebel, 3.188 (Oxford, Basil Blackwell, 1931-1932). C. K. >.

^{74b}The word "whereas" is used here in the obsolete sense of "where". Webster gives an example from Spenser: "Home she came, whereas her mother blind Sat in eternal night".

THE SEA AND THE WEATHER IN THE AENEID

In Vergil's story of the long wanderings of Aeneas after the sack of Troy there are, as one might expect, many references to the weather. The passages that portray the more violent manifestations of the elements have been collected by an author⁷⁴ who laments the use by translators of Vergil of vague terms in their versions of Vergil's descriptions of storms. Vergil's descriptions, he holds, are precise and show familiarity with the meteorological characteristics of the regions in which the storms take place.

Prayers for favorable winds and sacrifices to the sea and storms are mentioned frequently by Vergil. Two passages deserve quotation in the original:

"Ergo agite, et divum ducunt qua iussa sequamur;
placemus ventos et Gnosia regna petamus.
Nec longo distant cursu; modo Iuppiter adsit,
tertia lux classem Cretaeis sistet in oris".
Sic fatus, meritis aris mactavit honores,
taurum Neptuno, taurum tibi, pulcher Apollo,
nigram Hiemi pecudem, Zephyris felicibus albam⁷⁵.

Tris Eryci vitulos et Tempestatibus agnam⁷⁶
caedere deinde iubet solvique ex ordine funem.
Ipse, caput tonsae foliis evinctus olivae,
stans procul in prora pateram tenet extaque salsos
proicit in fluctus ac vina liquentia fundit.
Prosequitur surgens a puppi ventus euntis;
certatim socii feriunt mare et aequora verrunt⁷⁷.

It is to be taken for granted that Jupiter plays a rôle in the weather of the *Aeneid*⁷⁸, but that of Neptune in this connection seems more important. At the beginning of the epic Neptune bids the winds, which have been confounding heaven and earth, to hasten their flight, since to him belongs the dominion of the sea⁷⁹. When weather-wise Palinurus, scanning the heavens as the fleet is hastening from Africa, sees nothing but lowering clouds everywhere, he exclaims, "Quidve, pater Neptune, paras?"⁸⁰ Neptune is importuned by Venus to grant a safe passage for her wards from Sicily to Latium⁸¹. He tells her that he has often checked the fury of heaven and sea⁸², and that he is willing to grant her request, but demands that one life shall be a ransom for many⁸³:

Unus erit tantum amissum quem gurgite quaeres;
unum pro multis dabitur caput.

During the monotonous voyage that follows, Palinurus, made drowsy by the god of Sleep, falls overboard, thus paying for the safety of his companions⁸⁴.

In the first of the passages quoted above from the *Aeneid* (3.114-120) we see that a bull was sacrificed to Neptune and another to Apollo as a means of securing a safe voyage.

In the *Aeneid* still other divinities have to do with the weather. Pallas Athena assumes Jove's thunderbolt and hurls fire which sets aflame and scatters the

⁷⁴J. Rouch, *Orages et Tempêtes dans l'Enéide*, *Revue Générale des Sciences Pures et Appliquées*, 41 (1930), 307-312.

⁷⁵*Aeneid* 3.114-120.

⁷⁶Compare Horace, *Epodes* 10.24; Aristophanes, *Ranae* 847, and the scholium there. ⁷⁷*Aeneid* 5.772-778.

⁷⁸1.254-255, 3.116, 4.223, 5.687-699. See also Daniel-Servius on *Aeneid* 3.116.

⁷⁹1.133-141.

⁸⁰5.10-14.

⁸¹5.779-798.

⁸²5.801-802.

⁸³5.814-815.

See also 8.19-821.

⁸⁴5.835-863.

fleet of the returning Greeks⁸⁵. Jealous and angry, Juno has recourse to Aeolus, who marshals winds that cause a devastating storm⁸⁶. Later, Juno herself sends breezes to waft Iris on her course⁸⁷. When Aeneas and Dido go hunting, Juno brings upon them a cloud mingled with hail⁸⁸.

Prayers and wishes for favorable winds are not infrequent in the Aeneid⁸⁹. On one occasion, when Anchises desires such winds, he invokes without names the gods that exercise power over sea and land and tempests⁹⁰. Whether or not this method of appeal is intentional in this connection, it is in general a good way by which to avoid slighting deities who are in position to render aid.

THE SEA AND THE WEATHER IN THE ARGONAUTICA OF APOLLONIUS RHODIUS

In the preceding sections I have grouped the nautical weather lore of the greatest poems of Greece and Rome because of the peculiar interest in Homeric and Vergilian studies. There is another epic, the Argonautica of Apollonius Rhodius^{90a}, which has much to do with the sea. It complements the weather lore of the greatest epics, especially in regard to the activities of the deities.

For the important post of helmsman of the Argo there was chosen a man versed in weather wisdom, the Thespian Tiphys, who could foretell the rising wave, and from sun and star⁹¹ could foresee the stormy winds or the time for sailing⁹².

The god in whom the Argonauts seem most interested is seafaring Apollo, viewed both as Embasios and as Ekbasios. The oracle of Apollo promises to show Jason the paths over the sea if he begins his venture by sacrifice upon an altar on the beach to Apollo Embasios⁹³. When two steers are being sacrificed with due ceremony⁹⁴, Jason prays as follows⁹⁵:

Hear, O King, that dwellest in Pagasae and the city Aeonis . . . ; now do thou thyself guide the ship with my comrades safe and sound, thither and back again to Hellas. Then in thy honour hereafter we will lay again on thy altar the bright offerings of bulls—all of us who return; and other gifts in countless numbers I will bring to Pytho and Ortygia. And now, come, Far-darter, accept this sacrifice at our hands, which first of all we have offered thee for this ship on our embarkation; and grant, O King, that with a prosperous

weird I may loose the hawsers, relying on thy counsel, and may the breeze blow softly with which we shall sail over the sea in fair weather⁹⁶.

There are other references to Apollo as a seaman's god and to sacrifices to him⁹⁷. He is also called 'savior of ships'⁹⁸.

Other deities were concerned about the successful completion of this adventurous journey. As the heroes left Thynia, where they had made offerings to 'the blessed twelve'⁹⁹, Artemis set her foot upon a cloud and swept out to sea with thoughts friendly to them¹⁰⁰. In Libya, Orpheus bade the voyagers offer Apollo's tripod to the gods of the land as propitiation for their return¹⁰¹. After sacrificing the choicest of the sheep to Triton, Jason prayed to him to allow them to reach their homes¹⁰².

The omnipotent god, Zeus, has to do with wind, rain, thunder, and lightning¹⁰³, but he also saves from the baleful storm¹⁰⁴. After the murder of Absyrtus a voice that told of the wrath of Zeus proclaimed that the murderers would not escape the paths of the boundless sea and the grievous tempests unless Circe should cleanse them from their pollution¹⁰⁵.

In this poem, Rhea, whose weather activities are mentioned comparatively infrequently in the Classics¹⁰⁶, is recognized as a supreme weather deity¹⁰⁷. After a fierce tempest had kept the adventurers in the land of the Doliones for twelve days and twelve nights, on the next night "above the golden head of Aeson's son there hovered a halcyon prophesying with shrill voice the ceasing of the stormy winds; and Mopsus heard and understood the cry of the bird of the shore, fraught with good omen . . ." The seer touched Jason and thus addressed him¹⁰⁸:

Son of Aeson, thou must climb to this temple on rugged Dindymum and propitiate the mother of all the blessed gods on her fair throne, and the stormy blasts shall cease. For such was the voice I heard but now from the halcyon, bird of the sea, which, as it flew above thee in thy slumber, told me all. For by her power the winds and the sea and all the earth below and the snowy seat of Olympus are complete; and to her, when from the mountains she ascends the mighty heaven, Zeus himself, the son of Cronos, gives place. In like manner the rest of the immortal blessed ones reverence the dread goddess.

By the advice of Orpheus the Argonauts beached their ships upon the Island of Samothrace that they might be initiated into the mysteries of the Cabeiri, that they might sail the seas more safely¹⁰⁹.

With prayers, libations, and sacrifices they appeased Rhea, and at dawn the winds ceased¹¹⁰.

The activities of Hera are manifold. She pours mists about the Argonauts¹¹¹ and over the city of the Colchians¹¹². She stirs up storm winds¹¹³ and by

⁸⁵I.42-45; Servius on Vergil, Aeneid 11.259. In Iliad 11.45-46 both Athena and Hera are represented as thundering in honor of Agamemnon. In Aeneid 8.520-531 Venus gives an auspicious sign by thunder.

⁸⁶I.50-123. Compare Valerius Flaccus 1.574-654. Aeolus has power over the waves also, as we are told by Ovid, Metamorphoses 11.432. Other weather lore of Aeolus has been given in THE CLASSICAL WEEKLY 18.150 A, 20.44 B, 23.6 B. See also Servius on Vergil, Aeneid 1.52. Polybius, as quoted by Strabo 1.2.15, finds fault with Eratosthenes for saying that one could learn where Ulysses wandered by finding the cobbler who sewed the bag of the winds. It seems hard to believe that Eratosthenes was not jesting. For a humorous reference to Aeolus see the Greek Anthology 9.617.

Reference may also be made to a recent note by A. D. Fraser, The Origin of Aeolus, The Classical Journal, 28 (1933), 364-366. ⁸⁷5.606-607. ⁸⁸4.120-122. ⁸⁹3.253, 529, 5.59, 211. Compare 3.130, 5.26-27, 33-34, 777. ⁹⁰3.528-530.

^{90a}For Apollonius see a very interesting paper entitled Apollonius Called the Rhodian, by Dr. Moses Hadas, THE CLASSICAL WEEKLY 26.41-46, 49-54. C. K. >.

⁹¹For other references to stars and the weather see 1.1201-1204, 2.516-527, 3.745, 957-959.

⁹²1.105-108. ⁹³1.359-362. ⁹⁴1.402-410.

⁹⁵1.411-424. All translations from the Argonautica are taken from the version of the poem by R. C. Seaton, in The Loeb Classical Library.

⁹⁶See also 1.1425-1430.

⁹⁷1.966-967, 1186, 2.689-693, 927-928.

⁹⁸2.927. ⁹⁹2.531-533. ¹⁰⁰2.537-540. ¹⁰¹4.1547-1549.

¹⁰²4.1593-1600.

¹⁰³1.509-511, 730-734, 2.498-499, 525, 993-994, 1098-1121, 3.1399-1400, 4.270, 518-521, 1223-1225.

¹⁰⁴2.1183-1184. ¹⁰⁵4.584-588.

¹⁰⁶For another reference to those activities see THE CLASSICAL WEEKLY 25.201 A.

¹⁰⁷1.1078-1152. ¹⁰⁸1.1092-1102. ¹⁰⁹1.915-918.

¹¹⁰1.1103-1152. According to Orphic Hymn 14 gales at sea are raised by Rhea. The Orphic Hymns may be consulted conveniently in the edition of the Orphica by E. Abel (Leipzig and Prague, 1885). ¹¹¹4.647-648. ¹¹²3.210-214. ¹¹³4.578-580.

terrible lightnings restrains the Colchians from pursuing the Argo¹¹⁴. On one occasion she sends Iris to tell Aeolus to cause the west wind to blow until the heroes reach the Phaeacian Isle of Alcinous¹¹⁵. To that island the breezes do in fact carry them¹¹⁶, but she herself sends and directs winds¹¹⁷.

Artemis is called 'savior of ships'¹¹⁸, and the steeds of Poseidon are described as 'squall-footed'¹¹⁹.

The Argonautica contains one weather item of an entirely different kind. Above the tomb of Pelias on sea-girt Tenos there were two columns, one of which moved at the breath of the blustering north wind¹²⁰. This tradition has left its impress upon modern lore¹²¹:

... In Tenos there exists a legend that the winds live in caves at the north of the island; they tell you how Michael the Archangel once slew two refractory north winds and placed pillars on their tombs, one of which rocks when the north wind blows. What a curious survival this is of the legend of Hercules who slew Zetes and Kalais, near this very island, with his arrows, and over their tombs were placed two stelae, which rocked when Boreas blew!

After their return from their perilous expedition Jason and his chiefs dedicated the Argo to Poseidon at the Isthmus of Corinth¹²². Castor and Pollux are said to have shown their gratitude by building at Las a temple in honor of Athena Asia (i. e. Athena surnamed Asia)¹²³.

(To be continued)

UNIVERSITY OF MICHIGAN

EUGENE S. MCCARTNEY

REVIEW

Martin Classical Lectures. Volume One, 1930. Cambridge, Massachusetts: Harvard University Press (1931). Pp. x + 181. \$2.

For forty-five years Professor Charles Beebe Martin served as a teacher of Greek and Classical Art at Oberlin College. To honor him his former students and his friends established the Martin Foundation, under whose auspices lectures on classical subjects are to be delivered annually at Oberlin College. The volume under review gives the first series of such lectures.

The first two lectures, on Herodotus (3-29), and Thucydides (31-55), were delivered by Professor Martin himself. They give a fair and concise survey of the main, and more or less well known, facts pertaining to the two historians. In the case of Herodotus a brief analysis (5-9) of the opinions held concerning Herodotus by ancient and modern writers brings to the fore the sober conclusion that Herodotus can neither be justly accused of being a "Prince of Liars..." (5) nor justly charged with consciously distorting historical facts (9). This does not mean that Professor Martin overlooks Herodotus's defects (for them see 12-14, 28). Still, in Professor Martin's view (9), Herodotus is "...an honest and veracious historian..."

Herodotus was deficient in understanding of the philosophy of history (29), a quality with which Thucydides, to whom the second lecture is devoted, was amply endowed. The contrast between the two historians is briefly but well brought out (31-32, 54-55). Professor Martin deals equally well with other matters connected with Thucydides, e. g. his style (37-38), his speeches (47-51), his excellences (51-53). With all his admiration for the great historian, which breathes from every page, Professor Martin did not fail to note the defects of Thucydides (44-47). He finds that even his impartiality was not flawless (52). But one may hesitate to accept the statement (33) that "...To his exile is due in part his impartiality..." Since Professor Martin notes the effects of exile upon Ovid and Dante (33), the former of whom whines and the latter rages, he ought to have noted the effects of exile upon Cicero, and, above all, upon a finer and nobler ancient character than Ovid, namely Seneca the philosopher. It takes more than exile to make a man impartial: that quality is (to my mind) innate.

I am glad to notice that Professor Martin does not subscribe to a belief which was once quite widespread, that Thracian blood in Thucydides's veins was responsible for his lack of Attic graces of style. "... With him as with Meredith, the style is the man..." says Professor Martin (38).

The third lecture, which deals with Sophocles, was delivered by Professor Paul Shorey. From every point of view this lecture is a masterpiece and leaves an indelible impression. The exposition and the analysis of all the plays, including the fragments, are brief, but they cover every essential point and problem. There are generous quotations from the plays; some of the translations given are Professor Shorey's own. The chief value of the lecture lies in the fact that Professor Shorey, in his attempt to trace the influence of Sophocles upon modern literatures, and English literature in particular, went beyond the boundaries of Greek literature. Thus both the classicist and the student of English can read this lecture to great advantage. So, I may add, may also the enemies of the Classics.

In this lecture Professor Shorey coins the felicitous expression "corybantic Hellenism". See pages 89-91:

...Much of the fashionable literature in which we steep our minds, stimulating though it may be, is completely irrational. Sophocles remains the type of that harmony of reason and beauty which will always yield a higher kind of pleasure to those who submit their souls to its serene and soothing spell. Sophocles is then the best antidote to many of the aberrations and extravagances of present-day taste, and especially to what we may call corybantic Hellenism—the Hellenism of the late Isadora Duncan, of Miss Jane Harrison, of Mr. Cornford, and if not of Professor Murray himself, of many of his too fervent disciples. By corybantic Hellenism I mean the Hellenism which finds the Greek genius and the Greek religion, not in the imaginative reason, but rather in song and dance and Bacchic ecstasy...the Hellenism of Carl van Doren...the Hellenism of Miss Amy Lowell...the Hellenism of the distressing gushers about Sappho in rhythmic prose or unscannable Sapphics...the Hellenism of Miss Harrison herself, who has spread the infection far and wide, corrupting even Professor Murray when he tells us that a Greek god is the wine of the world...the

¹¹⁴4.507-510. ¹¹⁵4.760-769. ¹¹⁶4.819-822, 837, 891, 910.

¹¹⁷4.241-242, 301. ¹¹⁸1.570-571. ¹¹⁹1.1158.

¹²⁰1.1304-1308.

¹²¹See J. Theodore Bent, On Insular Greek Customs, The Journal of the Anthropological Institute of Great Britain and Ireland, 15 (1886), 398.

¹²²Apollodorus 1.9.27. ¹²³Pausanias 3.24.7.



Greek and Roman Weather Lore of the Sea (Continued)

Author(s): Eugene S. McCartney

Source: *The Classical Weekly*, Vol. 27, No. 2 (Oct. 9, 1933), pp. 9-13

Published by: [Classical Association of the Atlantic States](#)

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The Classical Weekly

VOLUME XXVII, No. 2

MONDAY, OCTOBER 9, 1933

WHOLE No. 719

GREEK AND ROMAN WEATHER LORE OF THE SEA

(Continued from page 6)

CONTINUANCE INTO HISTORIC TIMES OF EPIC IDEAS ABOUT THE WEATHER

The nautical meteorology of the great classical epics is quite naturally much concerned with deities, since they are able to send favorable breezes and to stay terrible storms. During the great days of Greece and Rome the gods maintained their position as masters of the elements. Nor would the heroes of the Iliad and the Odyssey have been compelled to readjust their ideas about divine control of the weather had they been brought to life again in Athens or in Rome. The transition to Christian meteorology was quite as easy, for converts had to do little more than substitute the names of the Christian deity and the saints for those of Zeus and the other gods and the weather magicians. Near the end of this paper I shall give a few examples of divine control of the weather as recorded in the Church Fathers (see the text in connection with notes 340-349, below).

PRAYERS FOR GOOD WEATHER AND A PROSPEROUS VOYAGE

Cicero¹²⁴ holds that, if one regards clouds as being controlled by the gods, tempests, which have been consecrated by the rites of the Roman people, must be so regarded. Hence rains, clouds, squalls, and storms in general must be considered under the power of the gods.

Since it was believed that the gods controlled the elements¹²⁵, prayers for favorable breezes were a natural consequence¹²⁶. Seamen felt gratitude when such breezes sprang up¹²⁷. One traveler prayed that the favorable weather which Zeus had sent in answer to his entreaties upon the sea might continue to waft him on till he reached the final haven in the voyage of life¹²⁸. Even to the dead one might wish a *bon voyage*¹²⁹.

Wind and wave were a dangerous combination. Prayers were raised for salvation from them as well as for their aid. We still have a lengthy invocation which an unknown traveler directed to Ocean for a happy voyage¹³⁰. Poseidon, too, might be called upon to guide a bark safely homeward over the surging sea¹³¹. Alcyone offered incense to all the powers in general and

made prayers to Juno to direct her husband safely over the seas¹³². Before killing himself on the shores of Africa Cato Uticensis prayed for a prosperous voyage for his men¹³³.

A better known entreaty, however, is that which Horace made to a ship to carry Vergil safely amid the perils of the sea¹³⁴. Upon it Wordsworth modeled a few lines called On the Departure of Sir Walter Scott from Abbotsford, for Naples:

Be true,
Ye winds of ocean, and the midland sea,
Wafting your Charge to soft Parthenope!

An interesting sailor's song called 'To the Rhodian Winds' is contained in a late third-century papyrus¹³⁵:

I commanded the Rhodian winds and the seaward parts when I wished to sail; when I wished to remain there, I said to the seaward parts that the sea should not be smitten. Make the ocean obedient to seafarers! Suddenly a whole tempest arises. Shut off the winds, and, night, grant that the waters be smooth.

OFFERINGS AND SACRIFICES FOR GOOD WEATHER AND SAFETY AT SEA

We have seen that in Homeric days sacrifices were made to the waters. Such sacrifices were offered through all antiquity. When one of Alexander's commanders, Nearchus, was about to put out from India and to face the terrors of an unknown sea, he sacrificed bulls to Poseidon, poured a libation upon the sacrifice, and threw the golden cup and mixing bowls into the deep as thank-offerings, at the same time praying that the expedition might fare well¹³⁶.

The Spartan Cleomenes, before embarking his army at Thyrea to sail to the region of Tiryns and Nauplia¹³⁷, sacrificed a bull to the sea.

At Tenos there were a temple and a statue of Poseidon¹³⁸, and a festival was held there in his honor¹³⁹.

On account of the storms the ancient ships sailing to Delos were often obliged to stop at Tinos to make sacrifices for their abatement, just as in later days sea captains made supplications to the Virgin at the church of the "Stavro," on the west coast of the island, for the same purpose¹⁴⁰.

¹²²Ovid, *Metamorphoses* 11.577-581.

¹²³Plutarch, *Moralia* 781 D.

¹²⁴Carmina 1.3. Other references to the propempticon are Callimachus, *Fragment* 114; Theocritus 7.52; Statius, *Silvae* 3.2. For a propempticon to an enemy, Mevius, see Horace, *Epodes* 10. Professor Knapp calls my attention to an interesting note by Professor G. L. Hendrickson, *Horace's Propempticon to Virgil* (= *Carmina* 1.3), *The Classical Journal* 3 (1908), 100-104.

¹²⁵The translation is by B. P. Grenfell and A. S. Hunt, *The Oxyrhynchus Papyri*, 11, No. 1383, page 237 (*Egypt Exploration Fund, London, 1915*).

¹²⁶Arrian 6.19.5.

¹²⁷Herodotus 6.76. We are told by Stephanus of Byzantium, s. v. *Βούθρωρος*, that, when Helenus was about to make a sacrificial offering of a cow before setting out from Troy, the intended victim avoided the blow and escaped through the midst of the sea.

¹²⁸Tacitus, *Annales* 3.63.

¹²⁹Strabo 10.3.11.

¹³⁰George Horton, *Home of Nymphs and Vampires: The Isles of Greece*, 15 (Indianapolis, The Bobbs-Merrill Co., 1929). See also *ibidem*, 37.

¹²⁴De Natura Deorum 3.51.

¹²⁵Compare Horace, *Carmina* 1.9.9-11 *Permitte divis cetera, qui simul strare ventos aequore fervido deproeliantis* . . .

¹²⁶See THE CLASSICAL WEEKLY 18.135 A. Prayers were made to Zephyr, too, for breezes favorable to ships. See *ibidem*, 24.15, note 153.

¹²⁷See e. g. Pindar, *Pythia* 1.65-68.

¹²⁸Greek Anthology 9.9.

¹²⁹H. Dessau, *Inscriptiones Selectae Latinae*, Volume II, Part II, No. 8031 (Berlin, Weidmann, 1906).

¹³⁰*Incerti Votum Ad Oceanum Pro Felici Navigatione*. See N. E. Lemaire, *Poetae Latini Minores*, 3.320-323 (Paris, 1824-1826).

¹³¹Athenaeus 209 E.

To the Delian Brizo, a goddess who revealed the future through dreams, women brought bowls full of all sorts of good things (except fish). They prayed to her concerning everything, but especially in behalf of the safety of the boats¹⁴¹. Cakes were offered to Zeus Ourios¹⁴². On the island of Syros offerings were made to Asclepius for protection from shipwreck¹⁴³.

As Cicero tells us¹⁴⁴, it was the custom of the Romans before embarking to offer a victim to the waves. Examples may readily be found in Roman history as well as in the legends of the Aeneid.

It was natural for Vergil to weave the incident of Palinurus¹⁴⁵ into his poem, for he was familiar with many examples of such sacrifice in connection with historical events. Before departing from Sicily on his fateful expedition to Africa in 204 B. C. Scipio prayed to the gods and the goddesses for success by land and sea, and he made sacrifice. A favoring wind quickly carried the fleet out of sight of land. At mid-day, however, a cloud encompassed it, so that with difficulty the vessels avoided striking one another. The cloud continued throughout the night, but the next morning was clear and the wind freshened. Ere long Scipio saw the land that was to give him fame and another name¹⁴⁶.

On setting out from Puteoli in 36 B. C. to seek vengeance against Caesar's enemies, Octavian made sacrifices and libations to the propitious winds, to Savior Neptune, and to Waveless Ocean, that they might aid him, but storms injured some ships and wrecked others¹⁴⁷. On learning of these calamities his foe, Sextus Pompeius, putting on a dark blue robe, offered sacrifice to the sea and to Neptune and persuaded himself that Neptune was on his side¹⁴⁸.

Some coins struck during the principate of Commodus show on the reverse sides a fleet putting to sea VOTIS FELICIBUS, while a bull is being offered to the waves by two figures, one of which represents Commodus¹⁴⁹. Perhaps the fleet is sailing to Africa for grain¹⁵⁰.

It would seem that no nation had a firmer belief in the efficacy of sacrifice to the waves than had the Saxons. We read that on setting out from the continent after a raid they abandoned every tenth captive to the agony of a watery grave¹⁵¹.

Even to-day offerings to the waters are not un-

known, as is attested by an article by Heinrich Hauser, *By Sail Around Cape Horn*^{151a}:

... Sacrifices must be paid to the sea. In our struggle around Cape Horn, which lasted nineteen days, the captain threw his live dog overboard. Another man cast off a shirt. These sacrifices must be thrown into the water on the windward side to propitiate the sea. Refuse is always thrown to leeward and if one threw some sacrificial offering over the leeward side the sea might look upon it as refuse and be offended.

We have already seen, as in the case of the Greek fleet at Aulis, that sacrifices were made to the gods to secure favorable winds¹⁵², but that the sacrifices might be made to the winds themselves. At the departure of the Argonauts Ancaeus offered a bull to the *rector aquarum*, to the Zephyrs, and to Glaucus, and a heifer to Thetis¹⁵³. In Titane, a town in Sicily, a priest made sacrifices to the winds on one night in every year¹⁵⁴.

PRAYERS AND VOWS AT SEA

As might be expected, efforts to win the favor of the gods continued at sea. A good example may be found in the Greek Anthology¹⁵⁵:

When with the blasts of the Libyan wind, the fierce Sirocco, the sea grew dark and belched up the sand from her profoundest depths, when every mast had fallen into the hollow of the deep and the lost merchant ship was drifting to Hades, Lysistratus called on the gods who help mariners, and they, for the sake of the temple ministrant alone, lulled the savage waves.

During the voyage of the Argonauts Orpheus besought the Samothracian gods to cause the winds to cease, whereupon Glaucus, the old man of the sea, appeared and attended the ship for two days¹⁵⁶.

While Herostratus, of Naucratis, was bringing from Cyprus to his home a small statue of Aphrodite, a great storm burst upon the ship as it was nearing Egypt, so that the mariners could not tell where they were. In this emergency everyone hastened to the statue of the goddess and implored it for safety, whereupon the sun shone again and revealed the harbor of Naucratis. On landing, Herostratus sacrificed in the Temple of Aphrodite and dedicated the statue to it¹⁵⁷.

Other gods, of course, were invoked at sea¹⁵⁸. During one dangerous storm when Christians were aboard a threatened ship, the pagans called upon Jupiter, Mercury, Minerva, and Venus¹⁵⁹. As we shall see, Castor and Pollux were the special friends of sailors and appeals were often made to them¹⁶⁰.

St. Ambrose's brother once made vows *apud sanctum martyrem Laurentium*. To them his safe return from a voyage was ascribed¹⁶¹.

¹⁴¹Athenaeus 335 B.

¹⁴²Corpus Inscriptionum Graecarum 2.975, No. 3797 (see note 46, above).

¹⁴³*Ἀθήναιον* 4.20, No. 33. This is quoted by W. H. D. Rouse, *Greek Votive Offerings*, 229 (Cambridge: At the University Press, 1902). (Ten volumes of the periodical *Ἀθήναιον* were published, 1872-1881).

¹⁴⁴De Natura Deorum 3.51.

¹⁴⁵See the text connected with note 84, above.

¹⁴⁶Livy 29.27.1-8. See also Appian, *Roman History* 8.13.75.

¹⁴⁷Appian, *Bellum Civile* 5.98-99.

¹⁴⁸*Ibidem*, 5.100. In the expiatory offerings of the Roman fleets the gods were invoked to bring evil upon the victims instead of upon the fleet. See *ibidem*, 5.96. <For a recent discussion of the incident referred to in the text see M. Hadas, *Sextus Pompey*, 114 (Columbia University Press, 1930). For a review of this monograph, by Professor Laistner, see THE CLASSICAL WEEKLY 25.110-111. C. K.>

¹⁴⁹H. Cohen, *Description Historique des Monnaies Frappées sous l'Empire Romain*, 3.357 (Paris, Rollin et Feuardent, 1883). See also J. Eckhel, *Doctrina Numorum Veterum*, 7.129 (1828).

¹⁵⁰See Lampridius, *Commodus* 17.7 *Classem Africanam instituit quae subsidio esset si forte Alexandrina frumenta cessassent*.

¹⁵¹Sidonius 8.6.15.

^{151a}The Living Age, 339 (1930), 170-171.

¹⁵²Lucian, *Vera Historia* 2.2, makes mention of sacrifices to Poseidon during a calm that lasted three days.

¹⁵³Valerius Flaccus, *Argonautica* 1.188-191.

¹⁵⁴Pausanias 2.12.1. Many examples of offerings to the winds have been collected by Paul Stengel in his article, *Die Opfer der Hellenen an die Winde*, *Hermes* 16 (1881), 346-350, and in his book, *Opferbräuche der Griechen*, 146-153 (Leipzig, Teubner, 1910). See also THE CLASSICAL WEEKLY 18.155 B.

¹⁵⁵9.290. I give W. R. Paton's translation, in The Loeb Classical Library.

¹⁵⁶Diodorus 4.48.6.

¹⁵⁷Athenaeus 675 F-676 B.

¹⁵⁸For instance, Zeus (Aratus, *Phaenomena* 426) and Isis (Tibullus 1.3.28). On Isis as a deity of seamen see also Gruppe, 1572, note 3 (see note 2, above).

¹⁵⁹See the text connected with note 351, below.

¹⁶⁰See the next section of this paper.

¹⁶¹St. Ambrose, *De Excussu Fratris Sui Satyri* 1.17 (Migne, P. L., 16.1295-1296).

An interesting example of a vow made at sea is to be found in the Greek Anthology¹⁶²:

Diogenes, when he saw his yard-arm broken by the blast of Boreas, as the tempest lashed the Carpathian sea by night, vowed, if he escaped death, to hang me, this little cloak, in thy holy porch, Boeotian Cabirus, in memory of that stormy voyage; and I pray thee keep poverty too from his door.

The best example I have found of sacrifice at sea is the one already given from the Homeric Hymns¹⁶³.

CASTOR AND POLLUX

Although there were many gods to whom those who were in distress at sea offered prayers and made vows, Castor and Pollux became the chief deities of seamen in danger. The ancient attitude toward these gods is well represented by Macaulay in his Lays of Ancient Rome¹⁶⁴:

Safe comes the ship to haven,
Through billows and through gales,
If once the Great Twin Brethren
Sit shining on the sails.

Such ideas date back to remote antiquity, for in the Homeric Hymns¹⁶⁵ the Dioscuri are called

... deliverers of men on earth and of swift-going ships when stormy gales rage over the ruthless sea. Then the shipmen call upon the sons of great Zeus with vows of white lambs, going to the forepart of the prow¹⁶⁶; but the strong wind and the waves of the sea lay the ship under water, until suddenly these two are seen darting through the air on tawny wings. Forthwith they allay the blasts of the cruel winds and still the waves upon the surface of the white sea: fair signs are they and deliverance from toil. And when the shipmen see them they are glad and have rest from their pain and labor.

Throughout all antiquity seamen prayed to Castor and Pollux as saviors both of sailors and of their ships¹⁶⁷. Himerius urged those who crossed the sea to let the Dioscuri pilot their fortunes¹⁶⁸. St. Paul departed from Melita in a ship of Alexandria "whose sign was Castor and Pollux"¹⁶⁹. These gods were invoked to be near Helena in her home-coming¹⁷⁰. Theocritus¹⁷¹ calls them saviors of men and also of ships which, disregarding the omens of stars rising and setting in the heavens, run into terrible gales.

In 359 A. D. there was danger of a famine in the city of Rome because violent contrary winds and an unusually tempestuous sea had prevented grain-laden ships from reaching Ostia. In this extremity ill feeling arose against the Prefect, Tertullus, but, while he was engaged in sacrificing at Ostia in the Temple of Castor

and Pollux, the sea became calm, the wind changed to a gentle *auster*, and the ships reached the harbor¹⁷².

ST. ELMO'S FIRE

Castor and Pollux were associated rather early with one of the most picturesque and fascinating displays of nature, St. Elmo's fire, the blue flame that flits here and there about ships, and dances on the points of spears¹⁷³. The attitude of ancient sailors toward this phenomenon, commonly called 'stars', is well set forth by Seneca¹⁷⁴:

... In violent storms at sea there sometimes appear, as it were, stars settling on the sails. The sailors who are in jeopardy then suppose they are being aided by the power of Castor and Pollux. They have really ground for better hope in this appearance, because it makes plain that the storm is breaking, and the wind falling. Otherwise the fires would flit about without settling....

Stars upon ships were early esteemed signs of good luck. After the Battle of Salamis the Aeginetans dedicated at Delphi three golden stars upon a mast, but Herodotus¹⁷⁵, who records this information, makes no mention of Castor and Pollux in connection with the stars. Tradition, however, records a far earlier association of these gods with these strange lights¹⁷⁶. Amid a storm during the voyage of the Argonauts Orpheus sacrificed and prayed to the gods of Samothrace for salvation. Thereupon a sudden calm ensued and two stars settled upon the heads of Castor and Pollux, members of the expedition. Ever since, tradition said, it had been the custom during the perils of storms at sea to call upon the gods of Samothrace¹⁷⁷ and to regard as Castor and Pollux the stars of deliverance that appear in answer to such calls.

One might fittingly, therefore, invoke the Dioscuri for safe conduct at sea, as did Horace¹⁷⁸ in behalf of his beloved Vergil:

Sic te diva potens Cypri,
sic fratres Helenae, lucida sidera,
ventorumque regat pater,
obstrictis aliis praeter Iapyga,
navis, quae tibi creditum
debes Vergilium finibus Atticis,
reddas incolumem, precor,
et serves animae dimidium meae.

There was a story in antiquity that, as Lysander was putting out from the harbor of Lampsacus to attack the Athenians at Aegospotami, the Dioscuri appeared as stars on either side of his ship¹⁷⁹. Maximus of Tyre

¹⁷²Ammianus Marcellinus 19.10.1-4. Ammianus, however, attributed this good fortune to the deity who had watched over the growth of Rome.

¹⁷³See, for example, Pliny 2.101. A remarkable example is to be found in Gregory of Tours, De Miraculis S. Martini 1.10 (Migne, P. L., 71.923). An excellent collection of both ancient and modern references to St. Elmo's fire has been made by A. S. Pease, in his note on Cicero, De Divinatione 2.77 (M. Tulli Ciceronis De Divinatione, University of Illinois Studies in Language and Literature, VI and VIII [1920, 1923]).

¹⁷⁴Naturales Quaestiones 1.1.11-12 (I give John Clarke's translation [London, Macmillan, 1910]). See also Horace, Carmina 1.12.27-32, 4.8.31-32.

¹⁷⁵Herodotus 1.92.2. Compare Valerius Flaccus 1.568-573.

¹⁷⁶Compare Diodorus Siculus 4.48.6-7.

¹⁷⁷Compare Statius, Silvae 3.2.8-12 Proferte benigna sidera et antennae gemino considite cornu, Oebali fratres; vobis pontusque polusque luceat; Iliacae longe nimbo sae sororis astra fugate, precor, totoque excludite caelo. See also Ovid, Fasti 5.720; Lucian, Charidemus 3; Prognosticorum Reliquiae 1.10-11 (Breyssig, 41: see note 2, above); Hesychius, under Διόσκουροι.

¹⁷⁸Plutarch, Lysander 12.1.

¹⁶²245. ¹⁶³See the text connected with note 54, above.

¹⁶⁴The Battle of Lake Regillus 765-768.

¹⁶⁵33 (I give H. G. Evelyn-White's translation, in The Loeb Classical Library).

¹⁶⁶The translation 'prow' is a strange inadvertence. The Greek text reads πρύμνη, but the reading πρύμνη has been suggested.

¹⁶⁷See Euripides, Orestes 1636-1637, Electra 1240-1241; Isocrates 10.61; Plato, Euthydemus 293; Pausanias 2.1.9; Plutarch, Moralia 426 C (compare 1103 D); Arrian, Epictetus 2.18.29; Lucian, De Mercede Conductus 1, Dialogi Deorum 26.2; Strabo 1.3.2; Sextus Empiricus, Adversus Mathematicos 9.86; Catullus 68.63-66; Horace, Carmina 3.29, 63-64; Propertius 1.17.18; Hyginus, Astronomica 2.22. See also K. Jaisle, Die Dioskuren als Retter zur See bei Griechen und Römern und ihr Fortleben in Christlichen Legenden (Tübingen, J. J. Heckenhauer, 1907).

¹⁶⁸Oraciones 1.10. ¹⁶⁹Acts 28.11.

¹⁷⁰Euripides, Helena 1495-1505.

¹⁷¹22.6-9. Compare 22.16-18.

says that he himself had seen the stars of these deities put on the right course a boat buffeted by storm¹⁸⁰.

Antiquity was not unanimous, however, in regarding St. Elmo's fire as favorable. When the 'stars' appeared singly, they were threatening; if they settled on the hull, they burned it¹⁸¹. A solitary light was generally called 'Helena'. Its epiphany portended a frightful fate for sailors¹⁸² and ships, but it was put to flight on the appearance of Castor and Pollux¹⁸³.

Some of these ideas survive and have been made use of by Charles Reade in his story, *The Cloister and the Hearth*¹⁸⁴. He puts these words into the mouth of the captain of a doomed ship:

"Friends," said he, "last night when all was fair, too fair, alas! there came a globe of fire close to the ship. When a pair of them come it is good luck, and nought can drown her that voyage. We mariners call these fiery globes Castor and Pollux. But if Castor come without Pollux or Pollux without Castor, she is doomed. Therefore, like good Christians, prepare to die."

Some of the ancients said that the constellation of the Gemini (Castorum Signa) created dangers at sea¹⁸⁵. In his work on the interpretation of dreams Artemidorus¹⁸⁶ considered the appearance of Castor and Pollux a sign of storm. Isidorus¹⁸⁷ held that a change of weather for the worse was to be expected when during sailing by night the water on the oars and the rudders emitted sparks.

There are other classical references to Castor and Pollux as guardians of those at sea, and to St. Elmo's fire¹⁸⁸. They may readily be found in the standard handbooks.

In modern times the appearance of St. Elmo's fire has likewise inspired both confidence and fear. One of the most interesting passages is to be found in Washington Irving's description¹⁸⁹ of the approach of Columbus to the New World on his second voyage:

Towards the latter part of October they had in the night a gust of heavy rain, accompanied by the severe thunder and lightning of the tropics. It lasted for four hours, and they < = the crews > considered themselves in much peril, until they beheld several of those lambent flames playing about the tops of the masts, and gliding along the rigging, which have always been the objects of superstitious fancies among sailors. Fernando Columbus makes remarks¹⁹⁰ on them, strongly characteristic of the age in which he lived. "On the same Saturday, in the night, was seen St. Elmo with seven lighted

tapers, at the topmast: there was much rain and great thunder; I mean to say, that those lights were seen, which mariners affirm to be the body of St. Elmo, on beholding which they chant litanies and orisons, holding it for certain, that in the tempest in which he appears, no one is in danger. Be that as it may, I leave the matter to them; but if we may believe Pliny, similar lights have sometimes appeared to the Roman mariners during tempests at sea, which they said were Castor and Pollux, of which likewise Seneca makes mention."

Another interesting description of this strange appearance is to be found in Dampier's *Voyages*¹⁹¹:

After four a clock the Thunder and the Rain abated, and then we saw a Corpus Sant at our Main-top-mast head, on the very top of the truck of the Spindle. This sight rejoiced our Men exceedingly; for the height of the Storm is commonly over when the Corpus Sant is seen aloft; but when they are seen lying on the Deck, it is generally accounted a bad sign.

Captain Dampier was told¹⁹² that, when the Spaniards see these fires,

... they presently go to Prayers, and bless themselves for the happy sight. I have heard some ignorant Seamen discoursing how they have seen them creep, or as they say travel in the Scuppers, telling many dismal Stories that hapned at such times: but I did never see any one stir out of the place where it was first fixt, except upon Deck, where every Sea washeth it about: neither did I ever see any but when we have had hard Rain as well as Wind; and therefore do believe it is some Jelly: but enough of this.

The frolicsome and capricious nature of the phenomenon is well pictured at the end of the next quotation, from Hakluyt's *Voyages*¹⁹³:

I do remember that in the great and boisterous storme of this foule weather, in the night, there came upon the toppe of our maine yarde and maine maste, a certaine little light, much like unto the light of a little candle, which the Spaniards called the Cuerpo-Santo¹⁹⁴, and said it was St. Elmo, whom they take to bee the advocate of sailers. . . . This light continued aboard our ship about three houres, flying from maste to maste, and from top to top; and sometimes it would be in two or three places at once¹⁹⁵.

Magellan's men, too, welcomed the sight of this peculiar flame¹⁹⁶:

During these great storms, they said that St. Elmo appeared at the topmast with a lighted candle, and sometimes with two, upon which the people shed tears of joy, receiving great consolation, and saluted him according to the custom of mariners. He remained visible for a quarter of an hour, and then disappeared, with a great flash of lighting, which blinded the people.

¹⁸⁰9.7 (H. Hobein's edition; Leipzig, Teubner, 1910). A good example of such guidance is to be found in Lucian, *Navigium Seu Vota* 8-9.

¹⁸¹Pliny 2.101.

¹⁸²Statius, *Thebais* 7.791-793 Non aliter caeco nocturni turbine Cori scit peritura ratis, cum iam damnata sororis igne Therapnaei fugebat carbasia fratres. See also Solinus 1.57 . . . sidus Helenae perniciosissimum navigantibus, and Sosibios, as quoted by the scholiast on Euripides, *Orestes* 1637. Compare Aeschylus, *Agamemnon* 688-689 Ἑλέναν . . . ἐλέαναι.

¹⁸³Pliny 2.101; Statius, *Silvae* 3.2.11-12; Lydus, *De Ostentis* 5. Chapter 57.

¹⁸⁴Fulgentius 2.16.

¹⁸⁵2.37.

¹⁸⁶De Natura Rerum 38.1.

¹⁸⁷Important references to St. Elmo's fire are as follows: Dares-Berg-Saglio, under Dioscuri, 2.263; Pauly-Wissowa, under Dioskuren, 5.1094-1097; Roscher, under Dioskuren, 1.1163-1164. See also A.B. Cook, *Zeus: A Study in Ancient Religion*, 1.763-764, 771-775 (Cambridge: At the University Press, 1914); J. G. Frazer, *The Magic Art and the Evolution of Kings*, 1.49-50 (London, Macmillan, 1917); *The Fasti of Ovid*, 4.121-122 (London, Macmillan, 1929); Th. Henri Martin, *La Foudre et le Feu Saint-Elme dans l'Antiquité*, *Revue Archéologique*, Nouvelle Série, 13 (1866), 168-179; Th. Henri Martin, *La Foudre, l'Électricité et le Magnétisme chez les Anciens*, 222-231, *et passim* (Paris, Didier, 1866).

¹⁸⁸The Life and Voyages of Christopher Columbus, Book 6, Chapter 1, near the end.

¹⁸⁹Historia del Almirante, Chapter 45.

¹⁹¹This work, by Captain William Dampier, has a very long title, "Dampier's Voyages, Consisting of a New Voyage Round the World . . ." It was edited by John Masefield (London, E. Grant Richards, 1906). For the passage given in the text see 409-410.

¹⁹²*Ibidem*, 410.

¹⁹³As quoted by T. F. Thistleton-Dyer, *The Folk Lore of Shakespeare*, 80 (London, Griffin and Farran, 1884).

¹⁹⁴For many interesting modern names of this phenomenon in various languages see the periodical entitled *Mélusine* 2 (1884-1885), 112-113 (the full title of this periodical is *Mélusine, Recueil de Mythologie, Littérature Populaire, Traditions, et Usages* . . .).

¹⁹⁵The last sentence reminds one of a passage which Shakespeare puts into the mouth of Ariel in *The Tempest* 1.2.196-203:

I boarded the king's ship; now on the beak,
Now in the waist, the deck, in every cabin,
I flamed amazement: sometimes, I'd divide,
And burn in many places; on the topmast,
The yards and bowsprit, would I flame distinctly,
Then meet and join. Jove's lightnings, the precursors
O' the dreadful thunder-claps, more momentary
And sight-outrunning were not . . .

¹⁹⁶The source of this quotation is given in note 189, above. In Irving's work it is a footnote. Irving gives his source as "Herrera, *decad ii. lib. iv. cap. 10*". See text connected with note 189, above.

As was true in antiquity, the appearance of St. Elmo's fire is to-day not always a happy augury.

This light, the Greek sailor thinks, portends an immediate onset of malevolent aerial powers, whom he straightway tries to scare away by every means in his power, by invocation of saints and incantation against the demons, by firing of guns, and, best of all, by driving a black-handled knife . . . into the mast. For he no longer discriminates as did the Greek mariner of old; then the appearance of two such flames was greeted with gladness as a manifestation of the Dioscuri, the saviours from storm and tempest, and evil was portended only if there appeared a single flame, the token of Helena, who wrecked as surely as her twin brothers guarded; now the phenomenon in any form bodes naught but ill¹⁹⁷.

The phenomenon is anything but kindly in William Falconer's poem, *The Shipwreck*¹⁹⁸:

High on the masts, with pale and livid rays,
Amid the gloom portentous meteors blaze.

Some additional lore of St. Elmo's fire is to be found in R. H. Dana's book, *Two Years before the Mast*¹⁹⁹. He mentions it in a description of a thunder storm "in the latitude of the West Indies" while the brig *Pilgrim* was "just in the track of the tremendous hurricane of 1830, which swept the North Atlantic, destroying almost everything before it":

. . . When we got down <from the mast> we found all hands looking aloft, and there, directly over where we had been standing, upon the main top-gallant-mast-head, was a ball of light, which the sailors name a corporant (*corpus sancti*), and which the mate had called out to us to look at. They were all watching it carefully, for sailors have a notion that if the corporant rises in the rigging, it is a sign of fair weather, but if it comes lower down, there will be a storm. Unfortunately, as an omen, it came down, and showed itself on the top-gallant yard-arm. We were off the yard in good season, for it is held a fatal sign to have the pale light of the corporant thrown upon one's face . . . In a few minutes it disappeared, and showed itself again on the fore top-gallant yard; and after playing about for some time, disappeared again; when the man on the fore-castle pointed to it upon the flying-jib-boom-end.

An English writer who over fifty years ago made some comments on the weather of Sicily associated St. Elmo's fire with definite winds²⁰⁰:

. . . Those from the east round to southerly are heavy, and loaded with an unwholesome mist, often accompanied with heavy rain, thunder, and lightning, during which the luminous meteor, called by seamen *campasani*, (a corruption of *Corpo Santo*) is sometimes seen, and hailed with similar ideas to those which inspired the ancients on the appearance of their *Castor* and *Pollux*.

Victor Hugo²⁰¹ says that

. . . In certain tempests, which characterize the equinoxes and the return to equilibrium of the prolific

power of Nature, vessels breasting the foam seem to give out a kind of fire, phosphoric lights chase each other along the rigging, so close sometimes to the sailors at their work that the latter stretch forth their hands and try to catch as they fly these birds of flame.

The belief that St. Elmo's fire portends storm is not without some justification²⁰²:

. . . They are indeed nothing but electric manifestations due to the highly charged condition, incident to thunderstorms, of the passing clouds and upper air, a condition that causes tall objects whether on land or sea to flare with a continuous coronal or brush discharge. Clearly, then, in the experience of the mariner, they are most common on the warmer oceans (actually more frequent still on mountain peaks) and since they indicate the prevalence of thunderstorm we may well agree that the following conclusion is in accord with experience and not, as some would tell us, merely prompted by superstition:

"Last night I saw St. Elmo's stars,
With their glimmering lanterns all at play
On the tops of the masts and the tips of the spars,
And I knew we should have foul weather today"²⁰³.

(To be continued)

UNIVERSITY OF MICHIGAN

EUGENE S. MCCARTNEY

Thought and Letters in Western Europe A. D. 500 to 900. By M. L. W. Laistner. New York: Lincoln MacVeagh, The Dial Press (1931). Pp. ix + 354. \$4.00.

In my reviews of Professor Eleanor S. Duckett's book, *Latin Writers of the Fifth Century* (*THE CLASSICAL WEEKLY* 26.29-30), and of the book by Messrs. F. A. Wright and T. A. Sinclair, *History of Later Latin Literature from the Middle of the Fourth Century to the End of the Seventeenth* (*THE CLASSICAL WEEKLY* 26.21-23), I referred to Professor Laistner's book, *Thought and Letters in Western Europe A. D. 500 to 900*, and quoted from it. It was with great pleasure that I set out to review the volume.

The period which Professor Laistner undertook "... within the moderate compass of a single volume. . ." (Preface, v) "to describe and estimate . . ." (*ibidem*) has been, from the point of view of completeness and unity of treatment, sorely neglected by English scholars. Students, therefore, of this period and of medieval literature in general owe a great debt to Professor Laistner for giving us in this book a uniquely methodical treatment of the history of thought and letters in those formative, and, therefore, most momentous and eventful centuries which followed the downfall of the Western Roman Empire. Momentous and eventful they were because from the chaos which followed the breakdown of the Empire there emerged a new civilization and a new order, fundamental in the formation of modern Europe.

Stormy centuries of such formative and transitional character, during which much salvaging had to be done to rescue the learning of the past, could hardly foster and

¹⁹⁷J. C. Lawson, *Modern Greek Folklore and Ancient Greek Religion*, 286-287 (Cambridge: At the University Press, 1910). See also G. F. Abbott, *Macedonian Folklore*, 241 (Cambridge: At the University Press, 1903).

¹⁹⁸Canto 3, Section 4.

¹⁹⁹Chapter 34 (near end). A not less interesting passage about 'corporants' may be found in Herman Melville, *Moby Dick*, Chapter 119. Darwin mentions this phenomenon in *The Voyage of the Beagle*, Chapter 3.

²⁰⁰Wm. H. Smyth, *Memoir Descriptive of the Resources, Inhabitants, and Hydrography, of Sicily and Its Islands*, 4-5 (London, John Murray, 1874).

²⁰¹The passage occurs in volume 2, page 25 of an anonymous translation published by Little, Brown, and Company, Boston, 1894. The passage may be found in other editions by consulting Part II, Book 1, Chapter 5.

²⁰²W. J. Humphreys, *Weather Proverbs and Paradoxes*, 69-70 (Baltimore, Williams and Wilkins Company, 1923). An interesting chapter called *The Fires of St. Elmo* is to be found in a book by C. F. Talman, *The Realm of the Air* (Indianapolis, The Bobbs-Merrill Co., 1931).

²⁰³These are the words of the *Padrone* in Longfellow, *The Golden Legend*, near the end of Part V.



Greek and Roman Weather Lore of the Sea (Continued)

Author(s): Eugene S. McCartney

Source: *The Classical Weekly*, Vol. 27, No. 3 (Oct. 16, 1933), pp. 17-22

Published by: [Classical Association of the Atlantic States](#)

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The Classical Weekly

VOL. XXVII, No. 3

MONDAY, OCTOBER 16, 1933

WHOLE No. 720

GREEK AND ROMAN WEATHER LORE OF THE SEA

(Continued from page 13)

THE SAMOTHRACIAN GODS

We have seen that there was some popular association of the Samothracian gods with Castor and Pollux²⁰⁴. Varro²⁰⁵ says that men in general meant these twin gods when they spoke of the Samothracian gods.

The Samothracian gods were invoked during storms at sea. On one occasion during the Argonautic expedition the winds ceased after Orpheus addressed himself to them²⁰⁶. Offerings were made to them after escapes from storms²⁰⁷.

Persons who had been initiated into the mysteries of the Cabeiria on the Island of Samothrace were supposed to be safeguarded from perils in general, including those of storms at sea²⁰⁸. As already noted²⁰⁹, the Argonauts landed on the island in order to undergo initiation, that they might continue their adventure more safely. Magical properties seem to have been attributed to the purple band which initiates wore around the waist²¹⁰.

It seems that in Rhodes a journey by sea might be the occasion for a group or an association to place itself under the protection of the sea gods of Samothrace and Lemnos²¹¹.

METHODS OF SHOWING GRATITUDE FOR SALVATION

A thankful traveler or sailor who had made a safe journey or escaped the terrors of a storm showed his gratitude in some way or other. He might set up an inscription such as *Neptuno Ex Voto Cn. Gelasus*²¹². . . Three persons with Roman names give thanks in Lesbos to God on High for deliverance after a tempest. Eutychus, who may have been a skipper, returns thanks at Delos to Fair-Weather Zeus and the Egyptian deities, on behalf of himself and his son and all on board²¹³.

The custom of making such offerings is familiar to all

²⁰⁴See the text connected with note 176, above.

²⁰⁵De Lingua Latina 5.58. On the confusion of the Dioscuri with the Cabeiri see the article Cabiri, by F. Lenormant, in Daremberg-Saglio, 1.763, and the article Dioscuri, by Maurice Albert, *ibidem*, 2.257-258.

²⁰⁶Diodorus 4.48.6.
²⁰⁷Greek Anthology 6.164. Compare Callimachus, Epigrams 48 (= Greek Anthology 6.301).

²⁰⁸Scholium on Aristophanes, Pax 277; Scholia on Apollonius Rhodius 1.917-918. It is stated in Orphic Hymns 38 that the Curetes, who dwell in Samothrace, protect those upon the sea (the Orphic Hymns may be consulted conveniently in the edition cited in note 110, above).

²⁰⁹See the text connected with note 109, above.

²¹⁰Scholium on Apollonius Rhodius 1.917.

²¹¹See F. Hiller von Gaertringen, Die Samothrakischen Götter in Rhodos und Karpathos, Mittheilungen des Kaiserlich Deutschen Archaeologischen Instituts, Athenische Abtheilung, 18 (1893), 386. For further information in regard to the weather activities of the Samothracian gods see Daremberg-Saglio, under Cabiri, 1.763; Bloch, in Roscher, 2.2532, under Megaloi Theoi; Kern, in Pauly-Wissowa, 10.1430-1435, under Kabeiros und Kabeiroi.

²¹²Corpus Inscriptionum Latinarum 6.534. Compare Corpus Inscriptionum Atticarum 3, Part I, 236; H. Collitz, Griechischen Dialekt-Inschriften, 3.3776 (Göttingen, 1884-1910).

²¹³Rouse, 230 (see note 143, above). On page 229, note 4, Dr. Rouse gives interesting references to similar material.

readers of the Classics. Sometimes they are in fulfillment of vows. The continuation of the quotation given above is doubtless thoroughly representative of ancient Greek practice²¹³:

... In Delos also, and to Anubis, Demetrius of Sidon dedicates a part of the ship's deck, which we may suppose to have saved his life when the ship went to pieces. There is a relief with a boat upon it, dedicated to the Dioscuri, which possibly is a seaman's thank-offering. In the second century after Christ, Artemidorus and his family dedicate a relief, representing a sacrificial scene, for deliverance at sea.

Perhaps a silver trireme in the Delian shrine may be a sailor's thank-offering. In the same treasury were silver anchors and a ship's beak, and a beak there was also in the shrine of Hero Iatrus at Athens. No doubt the images of Calm and of the Sea, which were dedicated to Poseidon at the Isthmus, had reference to perils upon the deep. A dedication by an admiral Pantaleon to "Poseidon saviour of ships and to Aphrodite mistress of ships" was found at Kertch. Some of the paintings in the temple of Phocaea may have been thank-offerings of seafarers, which depicted perils on the deep.

The votive group of Arion upon a dolphin, which was set up at Taenarum, commemorates a unique experience²¹⁴. After Arion had leaped from a ship in which pirates had been holding him captive and had gone about five hundred stades, he perceived that there was a calm behind him. It had doubtless been caused by divine agency to prevent pursuit. Arion was carried to safety by a dolphin²¹⁵.

In a modern Greek story a friendly fish effects a rescue in a manner not less striking. Among the countless offerings in the temple of the wonder-working icon of the Island of Tinos there is a conspicuous full-rigged ship made of silver²¹⁶.

... One day, during a storm off Marseilles, the captain of a Greek brig found his vessel rapidly filling with water, which gained on the pumps so fast that sinking was imminent. A supplication to the Virgin resulted in the immediate cessation of the inflow, and port was safely reached. An examination of the hull revealed a huge fish tightly plugging the hole which had been the cause of the dangerous leak!

The temple which Lucius Cornelius Scipio dedicated to the Tempestates²¹⁷ (or to Tempestas²¹⁸) was probably the fulfillment of a vow made in 259 B. C. when his fleet was almost overwhelmed by a storm during the struggle with the Carthaginians for possession of Corsica and Sardinia²¹⁹, ^{219a}.

²¹⁴Pausanias 3.25.7; Herodotus 1.24; Aelian, De Natura Animalium 12.45.

²¹⁵Plutarch, Moralia 162 A. I have found the account of the calm in this passage only.

²¹⁶G. Horton, 50 (see note 140, above). An incident hardly less miraculous is narrated on pages 42-43.

²¹⁷Corpus Inscriptionum Latinarum 1.32 (page 18), 6.1287 (page 283).

²¹⁸Ovid, Fasti 6.193-194.

²¹⁹See Corpus Inscriptionum Latinarum, 1, page 18. Contrast the action of Augustus (Suetonius, Augustus 16.2) who, after having lost a fleet in a storm, removed the statue of Poseidon from the sacred procession on the next occasion when there were games in the Circus.

^{219a}It is not stated when the storm occurred.

There was good precedent for all these manifestations of gratitude for salvation from the perils of the sea, since Deucalion, after drifting on the waters for nine days and nine nights, made sacrifice to Zeus, 'the god of escape' (*Zeὺς Φύγιος*)²²⁰.

Survivors of a storm might have their experiences painted on tablets, which they then hung up in temples²²¹. Sometimes, to aid them in appeals for charity, survivors carried about pictures of their hairbreadth escapes. A passage from Persius²²² may serve to illustrate the use of such tablets in begging:

quippe et, cantet si naufragus, assem
protulerim. Cantas cum fracta te in trabe pictum
ex umero portes?

Sailors who had narrow escapes from the perils of storm and shipwreck had a custom of shaving their heads on reaching safety, as we learn from Juvenal²²³:

Sed trunca puppe magister
interiora petit Baianae pervia cumbae
tuti stagna sinus. Gaudet ibi vertice raso
garrula securi narrare pericula nautae.

The association of shaved heads and *garrula pericula* was familiar, for Lucian²²⁴ speaks of

... mariners who, duly cropped, gather at the doors of a temple, with their tale of stormy seas and monster waves and promontories, castings out of cargoes, snappings of masts, shatterings of rudders; ending with the appearance of those twin brethren indispensable to nautical story, or of some other *deus ex machina*, who, seated at the masthead or standing at the helm, guides the vessel to some sandy shore....

THE DIVINE USE OF THE ELEMENTS IN PUNISHMENT AND RETRIBUTION

Upon the sea as upon the land the gods made use of the elements in showing their displeasure. The belief that the gods employed such means of punishing man is well illustrated by two anecdotes. When Diagoras was fleeing from Athens, he heard fellow-passengers say that the storm which overtook them was due to their having him, an atheist, on board. Pointing to other ships struggling with the same storm, he asked whether they too had a Diagoras aboard²²⁵. Bias was equally clever. On hearing some impious men calling upon the gods at sea, he admonished them thus: 'Be silent, lest they learn that you are sailing here'²²⁶.

The facility with which control of the weather might be ascribed to almost any divine being is well illustrated by a curious epigram in the Greek Anthology²²⁷:

Now nearing my country I said: "To-morrow shall this wind that blew so long against me abate." Scarce had I closed my lips when the sea became like hell, and

that light word I spoke was my destruction. Beware ever of that word "to-morrow"; not even little things are unnoticed by the Nemesis that is the foe of our tongues.

Neptune went out of his way to punish an evil-doer. Bellerophon, whose services in killing the warlike Chimarrhus had gone unrewarded by Iobates, King of Lycia, made earnest supplication to Neptune to render the country barren and unfruitful. When the hero faced about, the waves followed him and overwhelmed the land²²⁸.

The gods used the elements as a means of visiting punishment in warfare also. When Pyrrhus was passing by Locri on his return from Sicily, he plundered the treasury of Athena in that city. On the following day his fleet was damaged by a frightful tempest, and all the ships that were carrying the sacred money were driven upon the shore. From this calamity that proud king learned that gods actually do exist²²⁹. It will be recalled that the mutilation of the Hermae just before the departure of the Sicilian expedition was accounted a bad sign²³⁰. It was not necessarily connected with the weather, although storms in Sicily did add to the confusion of the Athenian retreat and to the severity of the disaster²³¹.

After rescuing Cyzicus from siege by Mithridates Lucullus hastened in pursuit of him. In his eagerness to reach the security of Pontus, Mithridates put to sea with his armament. He was overtaken by a storm which destroyed some vessels and disabled others. The storm was attributed to the wrath of Artemis, who wished, it was thought, to avenge the plundering of her shrine and the overthrow of her image²³².

On the day of the Battle of Philippi Domitius Calvinus was bringing two legions and other reinforcements to Octavian on transport ships when Murcus and Ahenobarbus intercepted them with one hundred and thirty galleys. Some of the foremost transports escaped, but, when the wind suddenly fell, the rest were caught in a dead calm and were delivered into the hands of the enemy by some god²³³.

The final blow that broke the ebbing morale of the Carthaginians in 201 B. C. was the destruction of their fleet by wind and storm. Then they accused the gods of conspiring against them and were willing to accept Scipio's terms²³⁴.

Sometimes the gods responded to appeals of nations to bring destruction upon the fleets of their enemies. When the threat of Xerxes's fleet was becoming imminent, the Delphians consulted the oracle with regard to themselves and Greece in general. They were advised to pray to the winds to become mighty allies of the Greeks. They set up an altar to the winds at Thyia, where the custom of appeasing the winds was still in vogue in the days of Herodotus²³⁵. The Athenians made sacrifice and called upon Boreas and Orithyia to destroy the ships of the Persians. Herodotus him-

²²⁰Apollodorus 1.7.2. See also Corpus Inscriptionum Graecarum, 2, page 300, No. 2374, lines 6-7 (edited by August Boeck, Berlin, Reimer, 1843). There Deucalion is said to have sacrificed salvation offerings. Zeus is also called *Σωτήρ* because of his guardianship over those at sea. See Athenaeus 292 B-C.

²²¹See, for example, Horace, *Carmina* 1.5.13-16, *Ars Poetica* 20-21; Juvenal 14.302; Vergil, *Aeneid* 12.766-769. See also the text connected with note 306, below. Such pictures were dedicated in shrines of Isis, too. See Juvenal 12.27.

²²²1.88-90. See also 6.32-33; Phaedrus 4.21.24-25.

²²³12.79-82. See also Greek Anthology 6.164 (The Loeb Classical Library, 1.383); Lucian, *Hermotimus* 86; Nonius 848 (in W. M. Lindsay's edition).

²²⁴De Merce Conductis 1 (I give the translation by H. W. Fowler and F. G. Fowler [Oxford: At the Clarendon Press, 1905]).

²²⁵Cicero, *De Natura Deorum* 3.89.

²²⁶Diogenes Laertius, *Bias* 1.86.

²²⁷7.630. I give W. R. Paton's translation, in The Loeb Classical Library.

²²⁸Plutarch, *Moralia* 247 A, 247 F-248 B.

²²⁹Livy 29.18.3-6. ²³⁰Plutarch, *Alcibiades* 18.

²³¹Thucydides 6.70.1. Compare 7.79.3.

²³²Plutarch, *Lucullus* 13.1-4.

²³³Appian, *Bellum Civile* 4.115.

²³⁴Appian, *Romana Historia* 8.56.

²³⁵Herodotus 7.178. See also Clemens Alexandrinus, *Stromata* 6.3.

self was unable to say whether the action of Boreas in falling upon the ships at anchor at Cape Sepias²³⁶ was an answer to prayer, but the Athenians had no doubt that, as at Athos, Boreas had again intervened in their behalf, and hence they erected a sanctuary to him beside the Ilissus²³⁷. Later the storm and the destruction of Persian vessels were attributed to divine intervention²³⁸. The Athenians had as much justification for their views on this subject²³⁹ as had the people of England in seeing the hand of the Deity in the calamity which befell the Spanish Armada, in 1588²⁴⁰.

Another sixteenth-century storm which ended the menace of an invasion occurred much nearer to Cape Sepias²⁴¹:

A reputation for magic and miraculous happenings has overhung the island of Tinos for countless years. As an instance may be mentioned the mysterious naked woman who mounted a cliff about 1570, on the appearance of a hostile Turkish fleet, and, raising her hands to heaven, besought the wind known as Garbinos (now called Garbes) to blow and disperse it. A fearful storm immediately broke out, which sank most of the ships, drowning a great number of those on board. The remainder were taken prisoners and made slaves.

MAGIC

The elements could be stilled by songs and by enchanted words. Arion's gifted music soothed the waters²⁴², and Orpheus had the power of lulling to sleep the howling winds and hail and the drifting snow and the roaring sea²⁴³. Such compliments to the efficacy of music seem sufficiently extravagant, but the song which Simonides²⁴⁴ composed to the winds caused them submissively to 'accompany the strains <of the singer>: ἀκολουθεῖ εὐθὺς τοῖς μέλεσι > and, blowing upon the stern of the ship, to help it onward in its course.

Not less miraculous was the ability of Thessalian witches to make the sea unmindful of raging Notus or to stir it up when the winds were at rest²⁴⁵. The Gallicenae could arouse the billows²⁴⁶. Medea had similar powers²⁴⁷. She gave Jason a charm or incantation which, when it was spoken three times, was powerful enough to cause calm sleep, and to allay a sea disturbed or a river in commotion²⁴⁸.

The population of Constantinople once held an indignation meeting when they believed that a certain Sopater had bound favorable winds and thus prevented the arrival of grain transports. The people persuaded the Emperor to give orders for him to be killed²⁴⁹.

A more modern weather magician is Prospero, with

whom his daughter Miranda pleads in *The Tempest*²⁵⁰:

If by your art, my dearest father, you have
Put the wild waters in this roar, allay them.

In our own land Goody Cole, as pictured by Whittier in the *Wreck of Rivermouth*, was supposed to have power to stir up storms:

"She's cursed," said the skipper; "speak her fair:
I'm scary always to see her shake
Her wicked head with its wild gray hair
And nose like a hawk, and eyes like a snake."

Another American writer, R. H. Dana, tells us, in *Two Years Before the Mast*²⁵¹, that he found the cook "fully possessed with the notion that Fins are wizards and especially have power over winds and storms".

OBSEQUIOUS WATERS

In the oration On the Manilian Law Cicero²⁵² proclaims, with a flourish, that even the winds and the storms favored Pompey. Many examples of similar ideas which were entertained with more or less credulity might be cited.

Along the sea beyond Phaselis in Pamphylia the beach was impassable when south winds were blowing, but it offered a quick and convenient journey when the north winds forced the waters to recede. As Alexander was leading a detachment along the coast, strong north winds overpowered the winds from the south and made the passage easy, a phenomenon which helped to create the impression that Heaven was aiding the youthful conqueror²⁵³.

In midwinter the Adriatic Sea yielded to Caesar and became navigable and quiet²⁵⁴.

The crossings of the Euphrates are rich in story. When none of Cyrus the Younger's men got wet above the breast in fording it, the people of Thapsacus said it had never before been crossed on foot. 'It seemed, accordingly, that here was a divine intervention, and that the river had plainly retired before Cyrus because he was destined to be king'²⁵⁵.

On reaching the same stream Lucullus was dismayed to find it swollen and turbid from winter storms, but at evening the waters began to subside and by daybreak islands and lofty banks were visible. The natives declared that such a thing had seldom happened before and explained that the river had made itself tame for Lucullus²⁵⁶.

When Vitellius was sacrificing for a favorable crossing of the Euphrates, the people in the neighborhood said that without any rain the river had overflowed its banks and turned around, so that encircling eddies had caused the foam to form in the shape of a crown, a seemingly favorable omen²⁵⁷.

Long before these events the swollen waters of a river in the land of Alcinous had subsided when Ulysses prayed to the river god²⁵⁸.

Rivers might show disfavor as well as favor. As a

²³⁶When the wind was raging at Cape Sepias, the Persians resorted to incantations and sacrifice, and the wind stopped on the fourth day. See Herodotus 7.191.

²³⁷Herodotus 7.189. ²³⁸Herodotus 8.13.

²³⁹See Pausanias 8.27.14, 8.36.6 for a somewhat similar incident in which the North Wind saves the Megalopolitans. See an interesting passage in P. Stengel, *Der Cult der Winde*, Hermes 35 (1900), 627-635.

²⁴⁰A medal struck by Queen Elizabeth to commemorate the defeat of the Spanish Armada bears the inscription *Afflavit deus et dissipantur*. See J. R. Green, *History of the English People*, 2.446 (New York, Harper and Brothers, 1878). Green translates the inscription by "The Lord sent his wind, and scattered them".

²⁴¹Horton, 32-33 (see note 140, above).

²⁴²Ovid, *Fasti* 2.84, 116.

²⁴³Greek Anthology 7.8. See also Horace, *Carmina* 1.12.7-10; Seneca, *Hercules Furens* 573.

²⁴⁴As quoted by Himerius, *Oratio* 3.14. ²⁴⁵Lucan 6.469-471.

²⁴⁶Pomponius Mela 3.6. ²⁴⁷Valerius Flaccus 8.351-352.

²⁴⁸Ovid, *Metamorphoses* 7.153-154.

²⁴⁹Eunapius, *Vitae Sophistarum* 41.

²⁵⁰1.2.3-4. ²⁵¹Near the end of Chapter VI. ²⁵²48.

²⁵³Arrian 1.26. Compare Plutarch, *Alexander* 17.3. For another example of the kindness of the weather to Alexander see Appian, *Civil Wars* 2.149.

²⁵⁴Appian, *Civil Wars* 2.150. Compare Plutarch, *Caesar* 38.3.

²⁵⁵Xenophon, *Anabasis* 1.4.17-18.

²⁵⁶Plutarch, *Lucullus* 24.4-5.

²⁵⁷Tacitus, *Annales* 6.37. ²⁵⁸Odyssey 5.441-452.

woman started to wade into the Jordan, the waters withdrew from her and recoiled against the opposite bank. When she was asked what wrong she had done, she replied, 'Seven little children to which I gave birth I have already slain. Conceiving them in incest, I was afraid to acknowledge them. The eighth I beat black and blue yesterday'²⁵⁹.

The ancients, too, used oil to make the sea clear and to calm it²⁶⁰. This item, however, is a little aside from the subject of my paper.

STONES AS PROTECTION AT SEA

A person carrying a *lapis ceraunius* at sea was safe from bolts and squalls²⁶¹. In general, stones that fell from heaven had several magical properties, one of which was the power of protecting sailors in storms²⁶².

ANIMAL LIFE AND THE SEA

Seal skins at mast heads afforded security²⁶³. The *remora*, when it was attached to the bottom of a vessel, enabled it to ride safely through violent storms²⁶⁴. Doubtless this is sympathetic magic, for it may be assumed that the sluggishness and steadfastness implied in the name of the fish were supposed to impart the same qualities to the ship. There was also a belief that ships sailed more slowly when they had on board the right foot of a turtle, one of the few extravagant stories which Pliny²⁶⁵ found *incredibile dictu*.

Not less marvelous are the powers attributed to the halcyon. The sailors' beliefs about it are told in an interesting manner by St. Ambrose, evidently from first-hand acquaintance with seamen. The halcyon, he says, breeds almost in the middle of the winter, at a time when the sea is roughest and the waves are dashing violently against the shores, that the esteem for it amid the solemnity of the sudden calm may be greater. When the eggs are laid, the sea quickly becomes mild, squalls subside, breezes cease to blow, and the main stands free of wind until the eggs are hatched seven days later. Still another calm period of seven days is needed to nourish and to rear the young. During the fourteen days, halcyon days, as the sailors call them, there is no fear of storms at sea²⁶⁶.

OTHER LORE OF STORMS CAUSED AND CONTROLLED

There was a nautical tradition that at sea no one should cut hair or nails except when the wind was angry²⁶⁷. Petronius²⁶⁸ tells of a passenger who saw a

barber carrying out his unseasonable ministrations on board ship. He execrated the act as an evil omen because it suggested the last resource of those in peril of shipwreck. The master of the ship wanted the guilty persons summoned that he might know by whose heads (*capitibus*) the ship was to be purified²⁶⁹. Among seamen even dreaming that the head had been shaved was a clear prognostic of shipwreck²⁷⁰.

There was also a belief, which was apparently widespread, that failure to observe chastity at sea endangered the ship and those on board. In the time of Achilles Tatius^{270a} seamen were often heard giving expression to a superstition of this kind. The orator Antiphon^{270b} tells us that those who embarked with unclean hands or otherwise contaminated brought death upon holy persons aboard as well as upon themselves. I do not find any mention of storms in this connection, but they were naturally the most frequent causes of danger and death at sea.

After the Battle of Philippi the head of Brutus was severed from his body to be taken to Rome. On the voyage across the Adriatic Sea it was thrown into the waters in an effort to appease a storm²⁷¹. Tempests at sea might be averted by a nude woman *etiam sine menstruis*²⁷².

FIGHTING THE SEA

We are told that the Germans assailed the sea with swords²⁷³ and that the Celts fought the waves²⁷⁴, but Strabo²⁷⁵ says it is not true that the Cimbri took up arms against the flood tides. Xerxes attempted to punish the unruly Hellespont by beating it with three hundred lashes; he also attempted to shackle it²⁷⁶. Such stories are in keeping with other lore about fighting the elements in general²⁷⁷.

King Canute was much wiser than Xerxes. When the tide refused to obey his command to stop, he drew the moral lesson that no one is worthy of the name of king except Him whom heaven, earth, and sea obey²⁷⁸.

WEATHER SIGNS OBSERVABLE ALONG AND UPON THE SEA

In previous papers I have listed numerous signs of weather derived by seamen and seafarers from the actions of animals, birds, and fish²⁷⁹. One ancient writer²⁸⁰ explains that 'the inhabitants of the waves' (*undarum incolae*) are able to foretell the weather because the water is always influenced by the rising wind. They are the first to feel a change in the sea.

²⁵⁹Gregory of Tours, *Miraculorum Liber I*, De Gloria Martyrum 88 (Migne, P. L., 71.783). In Joshua 3.15-17, the waters of the Jordan are described as standing and rising up, so that the Israelites passed over on dry ground.

²⁶⁰Plutarch, *Moralia* 914 F-915 A, 950 B; Michaelis Psellus, *De Omnifaria Doctrina* 133 (Migne, P. G., 122.768).

²⁶¹Damigeron 12.

²⁶²Marbodaues, *De Lapidibus* 428-445. This work is to be found in a supplement to Abrahami Gorlaei *Dactylithecae*, Part II (Leyden, 1695).

²⁶³See THE CLASSICAL WEEKLY 16.7 A.

²⁶⁴See THE CLASSICAL WEEKLY 16.7 A. See also Lucan 6.674-675. The virtues of the *echinus* are highly praised in Eustathii *Hexameri Metaphrasis Liber VII*, 5 (Migne, P. G., 30.944; compare 18.726).

²⁶⁵Pliny 32.41.

²⁶⁶Hexameron Liber V, 41 (Migne, P. L., 14.224). For other references to the effect of the halcyon on the weather see Vergil, *Georgics* 1.399; Ovid, *Metamorphoses* 11.410-478, 745-748; Plutarch, *Moralia* 983 A. See also D. W. Thompson, *A Glossary of Greek Birds*, 30 (Oxford: At the Clarendon Press, 1895).

²⁶⁷Petronius 104.

²⁶⁸Petronius 103-105.

²⁶⁹Compare the words of Neptune (Vergil, *Aeneid* 5.815), *Unum pro multis dabitur caput*.

²⁷⁰Artemidorus 1.22.

^{270a}5.16.

^{270b}5.82. Compare St. Ambrose, *De Noe et Arca Liber Unus*, 21.76 (Migne, P. L., 14.397).

²⁷¹Dio 47.49.2. See THE CLASSICAL WEEKLY 25.206 A.

²⁷²Pliny 28.77. ²⁷³Philo Iudaeus, *De Somniis* 2.17.

²⁷⁴Aristotle, *Ethica Eudemia* 3.1.25; Aelian, *Varia Historia* 12.23.

²⁷⁵7.2.1.

²⁷⁶Herodotus 7.35; Arrian 7.14.5; Plutarch, *Moralia* 455 D, 470 E.

Compare Juvenal 10.180.

²⁷⁷See THE CLASSICAL WEEKLY 18.165 B; 25.208 B.

²⁷⁸Henry of Huntingdon, *Historia Anglorum* 6.17. This work may be found in *Rerum Britannicarum Medii Aevi Scriptores*, or *Chronicles and Memorials of Great Britain and Ireland During the Middle Ages*, 74.180.

²⁷⁹See especially THE CLASSICAL WEEKLY 14.97-98, 16.5, 24.23. A number of good modern examples is given on pages 480-481 of an article by Walter Gregor, *Weather Folk-Lore of the Sea*, *Folk-Lore* 2 (1891), 468-482. See also A. S. Rappoport, *Superstitions of Sailors*, 70-71 (London, Stanley Paul and Company, 1928).

²⁸⁰Isidorus, *De Natura Rerum* 38.1.

Hence they struggle against it through fear, that they may not be carried to the shore, or through instinct, that they may not be overwhelmed when they are not facing its might.

Vergil lists a number of signs which should serve as warnings that the waves will not deal gently with boats upon them²⁸¹:

Iam sibi tum curvis male temperat unda carinis,
cum medio celeres revolant ex aequore mergi
clamoremque ferunt ad litora, cumque marinae
in sicco ludunt fulicae, notasque paludes
deserit atque altam supra volat ardea nubem.
Saepe etiam stellas vento inpendente videbis
praecipitis caelo labi, noctisque per umbram
flammarum longos a tergo albescere tractus;
saepe levem paleam et frondes volitare caducas,
aut summa nantes in aqua concludere plumas.
At Boreae de parte trucidat cum fulminat et cum
Eurique Zephyrique tonat domus, omnia plenis
rura natant fossis, atque omnis navita ponto
umida vela legit.

Some of these signs have to do with the water only; others are general in their application. They may be compared with the warnings marshaled by a weather seer in Victor Hugo, *Toilers of the Sea*²⁸², in order to dissuade a captain from setting sail:

"If it was my case, I shouldn't, Captain Clubin. The hair of the dog's coat feels damp. For two nights past the sea-birds have been flying wildly round the lantern of the light-house: a bad sign. I have a storm-glass, too, which gives me a warning. The moon is at her second quarter; it is the maximum of humidity. I noticed to-day some pimpernels with their leaves shut, and a field of clover with its stalks all stiff. The worms come out of the ground to-day; the flies sting; the bees keep close to their hives; the sparrows chatter together. You can hear the sound of bells from far off. I heard to-night the Angelus of St. Lunaire. And then the sun set angry. There will be a good fog to-morrow, mark my words. I don't advise you to put to sea. I dread the fog a good deal more than a hurricane. It's a nasty neighbor, that."

Among the ancients who lived upon the water, or near it, there naturally grew up a vast body of weather wisdom, some of which reflects the character of their lives. Vegetius²⁸³ says that the air and the sea itself and the size and the appearance of clouds instruct the anxious seamen. In a brief for a knowledge of weather signs Eustathius²⁸⁴ points out that those who are about to put to sea may keep their ships within the harbor when they foresee perils to come.

Theophrastus²⁸⁵ makes the following observations about several aspects of the sea:

...The ebb-tide indicates a north wind, the flowing tide a wind from the south. For, if the flowing tide sets from the north, there is a change to the south, and if an ebb-tide comes from the south, there is a change to the north. It is a sign of wind when the sea has a swell or promontories moan or there is a loud noise on the beach....

²⁸¹Georgics 1.360-373.

²⁸²I.218 (see note 201, above). The passage may readily be found in any edition by consulting Part I, Book V, Chapter IX.

²⁸³4.41.

²⁸⁴Eustathii Hexaemeri Metaphrasis Liber VI, 4 (Migne, P. L., 30.927).

²⁸⁵De Signis 29 (I give Hort's translation, in *The Loeb Classical Library*). The signs given by the swelling sea and the echoing beach are recorded in *Geoponica* 1.11.7.

The same author²⁸⁶ states that a loud voice heard in a harbor and reechoed many times is a sign of storm.

Pliny the Elder²⁸⁷ gives additional signs. If in a harbor a tranquil sea flows hither and thither and murmurs, it heralds wind. Such action in winter means rain. If amid tranquility shores and banks resound, a severe storm is indicated. When there are sounds along the shore while the sea is calm or when foam is scattered and waters bubble, there will be a heavy storm. During stillness the sea often swells and being blown (*inflatum*) higher than usual reveals that there are winds upon it.

Apropos of the last sentence one may quote from Thoreau²⁸⁸:

... Also the captain of a packet between this country and England told me that he sometimes met with a wave on the Atlantic coming against the wind, perhaps in a calm sea, which indicated that at a distance the wind was coming from an opposite quarter, but the undulation had traveled faster than it.

Vergil's long list of weather signs²⁸⁹ has a few that are pertinent to this part of my paper²⁹⁰:

Continuo ventis surgentibus aut freta ponti
incipiunt agitata tumescere et aridus altis
montibus audiri fragor, aut resonantia longe
litora misceri et nemorum increbrescere murmur²⁹¹.

With these verses may be compared a longer passage from Lucan²⁹²:

Niger inficit horror²⁹³
terga maris: longo per multa volumina tractu²⁹⁴
aestuat unda minax flatusque incerta futuri;
turbida testantur conceptos aequora ventos.
Tum rector trepidae fatur ratis: "Adspice saevom
quanta paret pelagus. Zephyros intendat an Euros
incertum est. Puppim dubius ferit undique pontus.
Nubibus et caelo Notus est: si murmura ponti
consulimus, Cauri verrunt mare. Gurgite tanto
nec ratis Hesperias tanget nec naufragus oras".

The words *murmura ponti* recall the modern expression, "song of the sea"²⁹⁵:

Along the Moray Firth the fishermen call the noise of the waves "the song of the sea." If the song is towards the east the wind will shortly blow from east or south-east. If a "long song" is heard from the bar at Banff, the wind will blow from the west²⁹⁶.

In antiquity there was a saying that, when a south wind was going to blow among the Aeolian Islands, a 'premonitory sound' was heard in the places from which the blasts issued²⁹⁷.

When at sea a sudden calm occurs during a wind, it indicates a change or an increase of wind²⁹⁸. When water gleams or flashes on the oars at night, there will be a storm²⁹⁹.

²⁸⁶De Signis 40. ²⁸⁷I.8.359. See also Breysig, 220.

²⁸⁸The Wellfleet Oysterman, Cape Cod, 116 (Riverside Edition).

²⁸⁹Georgics 1.351-464. ²⁹⁰Georgics 1.356-359.

²⁹¹Compare Lucan 5.551-552 Sed mihi nec motus nemorum nec litoris ictus... placet....

²⁹²5.564-573.

²⁹³Compare Homer, Iliad 7.64-65; Vergil, Aeneid 3.194-195.

²⁹⁴Compare Homer, Iliad 14.16-19.

²⁹⁵Gregor, 155 (see note 11, above).

²⁹⁶Many signs derived from the noises of the sea, so far as they are connected with winds, have already been given in THE CLASSICAL WEEKLY 24.23. Still other parallels may be found in a paper by J. Rouch, La Prévision du Temps dans Virgile, Revue Générale des Sciences Pures et Appliquées, 42 (1931), 19-25. This article has to do with the weather signs recounted in Vergil, Georgics 1, but it contains some material that is pertinent to my paper.

²⁹⁷Aristotle, Meteorologica 2.8, 367 a.

²⁹⁸Theophrastus, De Signis 31.

²⁹⁹Bede, De Natura Rerum 36. See also Breysig, 220; there rudders are included.

An interesting local item is recorded of the mart and promontory called 'Spices' (*Ἀρώματα*, i. e. Cape Guardafui). Here a ground-swell made the anchorage dangerous at times because the place was exposed to the north. When the deep water became turbid and changed its color, everybody knew that a storm was approaching and ships sought refuge in a recess of a promontory called Tabae³⁰⁰.

With this sign may be contrasted one given by Thoreau³⁰¹, who says that there will be a change from calm to storm when one can see through water to unusually great depths.

... If promontories seem to stand high out of the sea, or a single island looks like several, it indicates a change to south wind. If the land looks black from the sea, it indicates a north wind, if white, a south wind...³⁰²

The harbingers of wind which I listed in *THE CLASSICAL WEEKLY* 24.22 would hardly have proved of much use to those at sea. Of course, the Etesian Winds were closely watched by the ancients. A north wind meant fair voyaging from the Euxine Sea to Greece³⁰³.

(To be concluded)

UNIVERSITY OF MICHIGAN

EUGENE S. MCCARTNEY

CLASSICAL ARTICLES IN NON-CLASSICAL PERIODICALS

II

Mercur de France—March 15, *Archéologie*, Charles Merki [Reviews, favorable, of Camille Mauclair, *La Majesté de Rome*, and of Martial Douël, *Forums et Basiliques* (a book concerning Roman Africa)]; April 15, *Lettres Néo-Grecques*, D. Astériotis [this article contains reviews of several works by modern Greek authors]; May 1, Sappho, *Prêtresse d'Aphrodite*, Jean Larnac et Robert Salmon [this article enters into a discussion of Sappho's true character].
Metropolitan Museum Studies—Volume IV, Part II, Lydos, Gisela M. A. Richter ["To judge by his output as we know it, Lydos was an artist of marked individuality, with a bold, broad, and yet highly finished style. He was able to decorate successfully large vases, but was also interested in more delicate work, like the oinochoë in Berlin. Stylistically he belongs to the decade from 550 to 540 B. C.... At all events Lydos was evidently one of the numerous Easterners who migrated to Athens during the rule of Peisistratos, became thoroughly acclimated to their Attic environment, and by their work added a new luster to Athenian art". The article is accompanied by twenty Figures and one inserted Plate of illustrations]; On the Statue of Protesilaos in the Metropolitan Museum of Art, Oscar Waldhauer [the article is accompanied by seven illustrations]; The Temple of Apollo at Bassae, William B. Dins-

moor [a long discussion of some of the architectural and decorative problems connected with the temple at Bassae, which "still holds within its ordinary columnar shell more fantastic problems than any other building, I think we may say, of the Greek world". The article is accompanied by twenty-two Figures and two inserted Plates of illustrations]; Classical Mythology in Mediaeval Art, Erwin Panofsky and Fritz Saxl [the article, accompanied by sixty illustrations, gives special attention to representations of Hercules, Perseus, Mercury, and scenes from the Trojan War].

The Nation—April 26, Brief review, favorable, anonymous, of Babette Deutsch, *Mask of Silenus: A Novel About Socrates*.

The New Republic—April 5, Brief reviews, uncritical, anonymous, of M. I. Rostovtzeff, *Caravan Cities*, and M. I. Rostovtzeff, *Out of the Past of Greece and Rome*; April 12, Review, unfavorable, by A. M. Harmon, of T. E. Shaw, *The Odyssey of Homer*, Newly Translated into English Prose; Brief review, generally favorable, anonymous, of Babette Deutsch, *Mask of Silenus: A Novel About Socrates*; May 3, Brief review, favorable, anonymous, of A. E. Taylor, *Socrates*; June 7, Brief review, mildly favorable, anonymous, of *The Cambridge Ancient History*, Volume IX.

Bulletin of the New York Public Library—April, First English Translation of the Geography of Claudius Ptolemy, Victor H. Paltsits [a favorable review of E. L. Stevenson, *Geography of Claudius Ptolemy*, Translated into English and Edited].

The Nineteenth Century and After—April, What Should We Teach?, Guy Boas [the article contains several pointed remarks on the study of Greek and Latin]; The Influence of the Spice Trade on World History, Sir Percy Sykes.

Nuova Antologia (Rome)—February 1, *Filologia Classica*, Augusto Rostagni [Review, favorable, of Ettore Romagnoli, *I Poeti Greci Tradotti: I Poeti Lirici*; Review, qualifiedly favorable, of J. M. Edmonds, *Elegy and Iambus with the Anacreontea*; Review, qualifiedly favorable, of Bruno Lavagnini, *Nuova Antologia dei Frammenti della Lirica Greca*]; May 1, In Margine al Congresso di Diritto Romano, Pietro de Francisci; Rievocazioni del Teatro Classico, Biagio Pace; May 16, Congressi, Giuseppe Ceccarelli [a report of the Terzo Congresso Nazionale di Studi Romani, held at Rome, April 22-27, 1933].

Proceedings of the American Academy of Arts and Sciences—May, A Suggestion Concerning Plato's Atlantis, W. A. Heidel [the accounts of the Island of Atlantis in Plato's *Timaeus* (21 E-25 D) and Critias, which are clearly intended as fiction, should be studied in the light of certain passages of Herodotus, notably 2.142-143 and 2.102-106. The "entire Greek tradition regarding Egypt, and especially regarding the Egyptian priests, ... was from beginning to end the vehicle of Greek speculations The complex of motifs in the stories of Solon and Hecataeus in Egypt points unmistakably to the <early Greek> historico-geographical line of tradition,

³⁰⁰Periplus Maris Erythraei 12. <This work may be consulted in a volume entitled Periplus of the Erythraean Sea. Travel and Trade in the Indian Ocean by a Merchant of the First Century. Translated from the Greek and Annotated by Wilfred H. Schoff (London and New York, Longmans, Green and Co., 1912). C. K.>.

³⁰¹The Beach Again, Cape Cod, 150 (Riverside Edition).
³⁰²Theophrastus, De Signis 31 (I give A. Hort's translation, in The Loeb Classical Library).
³⁰³Xenophon, Anabasis 5.7.7.



Greek and Roman Weather Lore of the Sea (Concluded)

Author(s): Eugene S. McCartney

Source: *The Classical Weekly*, Vol. 27, No. 4 (Oct. 23, 1933), pp. 25-29

Published by: [Classical Association of the Atlantic States](#)

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The Classical Weekly

VOLUME XXVII, No. 4

MONDAY, OCTOBER 23, 1933

WHOLE No. 721

GREEK AND ROMAN WEATHER LORE OF THE SEA

(Concluded from page 22)

STARS

Stars and constellations were read by seamen as well as by shepherds and husbandmen in general³⁰⁴. By such means the ancients knew when they might with safety ply the treacherous sea with oars and launch the well-armed fleet³⁰⁵.

A star often mentioned is Arcturus. Both at its rising and at its setting it had many weather associations. This star is mentioned in a contract of bottomry preserved in Demosthenes's oration against Lacritus³⁰⁶. The interest on a sum of money lent on security of a ship sailing from Athens to the Borysthenes and back was to be two hundred and twenty-five drachmae on a thousand, but, if it sailed 'with Arcturus' from the Euxine to Hierum³⁰⁷, the interest was to be three hundred drachmae.

Vergil³⁰⁸, too, was aware of the danger which Arcturus brought to sailors upon the Euxine Sea:

Praeterea tam sunt Arcturi sidera nobis
Haedorumque dies servandi et lucidus Anguis
quam quibus in patriam ventosa per aequora vectis
Pontus et ostriferi fauces temptantur Abydi.

The Euxine is still dangerous to sailors, at least at times, according to Gibbon³⁰⁹:

To navigate the Euxine before the month of May, or after that of September, is esteemed by the modern Turks the most unquestionable instance of rashness and folly.

In Greece the rising of the Pleiades in May was the signal to put to sea³¹⁰. It was at this time that the Argo began its venturesome voyage³¹¹. In India, however, it was the *setting* of the Pleiades which was welcomed. On reaching the mouth of the Indus, Alexander's admiral, Nearchus, found the Etesian Winds blowing from 'the great sea' at a time when in Greece they were coming from the north. In this region the favorable season for sailing was from the beginning of winter, i. e. the setting of the Pleiades, till the winter solstice³¹².

Quotations from the sepulchral epigrams of the Greek Anthology will show how dangerous the Haedi (or Kids) and Orion might be to seamen and travelers by sea³¹³.

³⁰⁴See THE CLASSICAL WEEKLY 20.43-49, 51-54, *passim*.

³⁰⁵Vergil, Georgics 1.254-255.

³⁰⁶10-13. The same contract mentions the possibility that the ship will not enter the Euxine at all, and will wait in the Hellespont for ten days after the rising of the Dog-Star before returning to Athens. In that case a lower rate of interest was to be paid.

³⁰⁷I do not know what Hierum is meant, but it seems to be some place well within the Bosphorus.

³⁰⁸Georgics 1.204-207.

³⁰⁹E. Gibbon, The History of the Decline and Fall of the Roman Empire, edited by J. B. Bury, 1.264 (London, Methuen and Co., 1897).

³¹⁰See THE CLASSICAL WEEKLY 20.47 B, 48 B.

³¹¹Theocritus 13.25-29.

³¹²Arrian 6.21.1-2.

³¹³The translations in the text connected with notes 314, 315, and 316 are by W. R. Paton, in The Loeb Classical Library.

Lycus of Naxos died not on land, but in the sea he saw his ship and his life lost together, as he sailed from Aegina to trade. Now he is somewhere in the sea, a corpse, and I his tomb, bearing his idle name, proclaim this word of truth "Sailor, foregather not with the sea when the Kids are setting"³¹⁴.

I am the tomb, traveller, of Bito, and if leaving Torone thou comest to Amphipolis, tell Nicagoras that the Strymonian wind at the setting of the Kids was the death of his only son³¹⁵.

The fierce and sudden squall of the south-east wind, and the night and the waves that Orion at his dark setting arouses were my ruin, and I, Callaeschrus, glided out of life as I sailed the middle of the Libyan deep. I myself am lost, whirled hither and thither in the sea a prey to fishes, and it is a liar, this stone that rests on my grave³¹⁶.

Another epigram expresses surprise that a man "who rode on the sea more than a gull . . ." owed his death, not to Arcturus, but to his length of years³¹⁷.

In a modern poem, Sweeney among the Nightingales, by T. S. Eliot³¹⁸, we find a reflection of ancient ideas:

Gloomy Orion and the Dog
Are veiled; and hushed the shrunken seas . . .

ASTROLOGY

Since the stars and the planets provided a large number of weather signs³¹⁹, it was but natural that astrologers should make use of them in forecasting the weather at sea. Most lore of this kind is monotonous as well as complex and bewildering³²⁰. Hence I shall content myself with mentioning a few of the simpler examples.

When the sun is in Pisces, everything is thrown into commotion. At that time waters roughened by winds raise troubled billows as high as the stars³²¹. Mercury in Gemini vouchsafes a benign heaven and sea to sailors³²²; in Libra it promises a sea without winds³²³.

The first thunder after the Dog-Star rises in Virgo means, among other things, danger for those who are sailing the sea³²⁴.

If on July 20 the moon is in Aries or in Pisces, the sea will be stormy. If on the same date it is in Gemini, or if on July 15 it is in Pisces, there will be shipwrecks. If it is in Aquarius on July 20, the sea will become wild from both winds and storms. There will also be thunderbolts and earthquakes and shipwrecks³²⁵.

Astrologers also brought their knowledge into play in order to tell what sort of weather ships setting out from

³¹⁴Greek Anthology 7.272. ³¹⁵*Ibidem*, 7.502. Compare 640.

³¹⁶*Ibidem*, 7.273. ³¹⁷*Ibidem*, 7.295.

³¹⁸T. S. Eliot, Poems 1909-1925, 61 (London, Faber and Gwyer, 1926).

³¹⁹See THE CLASSICAL WEEKLY 20.43-49, 51-54.

³²⁰I have given numerous examples in other connections in THE CLASSICAL WEEKLY 22.29-30, 36, 24.25, 25.186-188.

³²¹Prognosticorum Reliquiae 2.19-20 (compare Breysig, 43: see note 2, above).

³²²*Ibidem*, 3.121 (Breysig, 51).

³²³*Ibidem*, 3.154 (Breysig, 53).

³²⁴Geoponica 1.10.7. ³²⁵Astrolog. Graec., 7.183-187, *passim*.

distant ports on a certain day had encountered³²⁶. When an inquirer at Smyrna became anxious over the failure of a ship to arrive from Alexandria, the positions of the planets conveyed the information that the vessel had run into a severe storm and that those on board had been saved, but only after having been transferred to another vessel³²⁷.

Examples of modern astrological weather lore³²⁸ may be found mingled with other superstitions in a passage in Shakespeare³²⁹:

... but when the planets
In evil mixture to disorder wander,
What plagues, and what portents, what mutiny,
What raging of the sea, shaking of earth,
Commotion in the winds, frights, changes, horrors,
Divert and crack, rend and deracinate
The unity and married calm of states
Quite from their fixure!

NAUTICAL WEATHER SEERS

It was obviously a great advantage for ancient travelers and seamen to be able to forecast the weather, possunt enim navigaturi intra portum retinere classem futura pericula praevidentes³³⁰. Vegetius³³¹ thought it incumbent upon those who were in command of expeditions by sea to be able to recognize indications of storm.

As we have seen, one of the qualifications of Tiphys, the helmsman of the Argo, was his ability to foretell the weather³³². Almost equally gifted was his understudy Erginus

who knoweth of old the treacherous deep, and knoweth the number of the stars on a clear night, and which of the winds Aeolus is minded to let forth from their prison-cave: inasmuch that Tiphys, when his eyes are weary of gazing constantly upon the Bear, is not afraid to commit into his charge the steerage of the vessel and the observation of the heavens³³³.

Proficiency as a nautical weather prophet doubtless required much experience in observation as well as natural aptitude. Perhaps Palinurus had the proper qualifications. When a lowering sky threatened the fleet of Aeneas after it had left Sicily, the pilot told his leader that, even with a pledge of assurance from Jupiter himself, he would not hope to reach Italy in such weather³³⁴. The boatman Amyclas, whom Caesar tried to reassure with the words 'You are carrying Caesar'^{334a}, is likewise represented by Lucan as thoroughly conversant with various signs, but Lucan³³⁵ took most of these signs from Vergil's list in the Georgics³³⁶.

More realistic weather seers were the captains who in 255 B. C. repeatedly warned Marcus Aemilius and

Servius Fulvius not to sail along the southern coast of Italy, not only because there were few safe anchorages, but because of two dangerous astral periods, that of Orion, which had not yet set, and that of the Dog-Star, which had not yet risen. A fierce storm brought in its train an overwhelming disaster. Polybius³³⁷ knew of no greater disaster suffered at sea at one time.

A nautical weather reader whom we know by name is Menas (Menodorus), whose ability to interpret signs helped him to save the fleet of Sabinus, which had been acting with that of Octavius Caesar in operations against Sextus Pompey along the western coast of Lower Italy, in 38 B. C. On the day after a great wind had dashed some of the ships against the promontory of Scyllaeum, a still more terrible storm arose, but Menas, being experienced on the sea, foresaw it and took measures that enabled him to ride out the storm, whereas many ships of the commanders who had no exact knowledge of nautical affairs were cast upon the shore and wrecked³³⁸.

Doubtless many ancient pilots and captains might have served as a model for the following sympathetic and vivid portrayal of a seaman versed in weather lore of the sea³³⁹:

The sea-captains' table was presided over by an old captain of a large vessel, M. Gertrais-Gaboureaux. M. Gertrais-Gaboureaux could hardly be regarded as a man; he was rather a living barometer. His long life at sea had given him a surprising power of prognosticating the state of the weather. He seemed to issue a decree for the weather to-morrow. He sounded the winds, and felt the pulse of the tides. He might be imagined requesting the clouds to show their tongue,—that is to say, their forked lightnings. He was the physician of the wave, the breeze, and the squall. The ocean was his patient. He had travelled round the world like a doctor going his rounds, examining every kind of climate in its good and bad condition. He was profoundly versed in the pathology of the seasons. Sometimes he would be heard delivering himself in this fashion: "The barometer descended in 1796 to three degrees below tempest point." He was a sailor from real love of the sea.

CHRISTIAN WEATHER LORE OF BODIES OF WATER

Christian weather lore of bodies of water may fittingly start with an incident in the life of Christ. He rebuked the winds upon the Sea of Galilee and caused a great calm³⁴⁰. Christian writers of the early centuries of our era had, therefore, both Christian and pagan traditions to emulate when they described the quelling and the controlling of the elements at sea.

We read that, while St. Andrew was on board a ship sailing through the Hellespont on his way to Byzantium, a rough sea and a strong wind threatened the safety of the vessel. After praying to God, the Apostle commanded the wind, and it became silent. At once the waves subsided and tranquility reigned³⁴¹.

At Epidaurus St. Hilarion stilled a tidal wave by

³²⁶*Ibidem*, 1.102-104. ³²⁷*Ibidem*, 1.103-104.

³²⁸See also THE CLASSICAL WEEKLY 25.186 B.

³²⁹Troilus and Cressida 1.3.94-101.

³³⁰Eustathii Hexaemeri Metaphrasis Liber VI, 4 (Migne, P. L., 53.925).

³³¹4.38 Qui cum exercitu armatis classibus vehitur turbinum signa debet ante praenoscere. I give here the text printed by C. Lang, Flavi Vegetii Renati Epitoma Rei Militaris² (Leipzig, Teubner, 1885).

³³²See the text connected with notes 91-92, above.

³³³Valerius Flaccus 1.416-419. I give the translation by H. G. Blomfield, in The Argonautica of Gaius Valerius Flaccus Setinus Balbus, 76-77 (Oxford, B. H. Blackwell, 1916). <For a notice, by Charles Knapp, of this book, see THE CLASSICAL WEEKLY 11.110-111. C. K.>

³³⁴Vergil, Aeneid 5.17-18. ^{334a}Plutarch, Caesar 38.3.

³³⁵Vergil, Aeneid 5.539-576.

³³⁶1.351-464.

³³⁷1.37.1-4.

³³⁸Dio 48.48.1-5. Compare Appian, Bellum Civile 5.10.89. Appian uses the name Menodorus.

³³⁹Victor Hugo, Toilers of the Sea, 1.142 (see note 201, above). The passage may readily be found in other editions by consulting Part I, Book V, Chapter 1.

³⁴⁰Matthew 8.26; Mark 4.39. See also Matthew 8.27.

³⁴¹Liber De Miraculis Beati Andree Apostoli, edited by Max Bonnet, in Monumenta Germaniae Historica, Scriptores Rerum Merovingicarum, Tome 1, Chapter 8, page 831.

making the sign of the cross three times in the sand and by stretching out his hands³⁴². Nicetius, Bishop of Trèves, likewise made the sign of the cross above the waves to cause a storm to cease³⁴³.

Beside the Garonne River there was a tomb of Saint Romanus, a presbyter of Burdigala (Bordeaux), who had been laid to rest in 382 A. D. To him persons who were threatened with death on the raging waters of the river would direct their prayers. 'Have mercy upon us, holy Romanus, confessor of God', they said, whereupon his sanctity would prevail and the storm would subside³⁴⁴. On one occasion after rain had fallen for several days and when winds were stirring up 'mighty mountains of billows' (*fluctuum montes validi*) in this river, Gregory of Tours wished to cross. He invoked the blessed confessor, who made smooth the waters in the channel, whereupon Gregory boarded a ship and reached the other side of the stream in safety³⁴⁵.

As Baudinus, Bishop of Tours, was traveling by sea, suddenly there came a lowering cloud attended by a violent wind. The ship was at the mercy of 'a pile of waters' (*undarum mole*). The plight of the vessel is described by Gregory of Tours³⁴⁶ with obvious Vergilian reminiscences³⁴⁷: *Tollitur caput primum in fluctus, secundum declinatur inter undarum hiatus. Hi in scena montis aquosi dependent, hi apertis undis in ima dehiscunt*. . . . In spite of the tossing, the yard which carried the sign of the cross³⁴⁸ did not fall. When all others had resigned themselves to death, Baudinus called upon St. Martin for immediate aid. At once there came a very sweet odor like that of balsam, and fragrance pervaded the ship as if someone were carrying a censer about it. Thereupon the violent winds abated, the masses of water sank, and the sea was rendered tranquil. No one doubted that the storm had been allayed by the presence of the saint.

Soon after leaving Alexandria for Greece a ship on which Gregory Theologus was a passenger ran into an unusually severe storm. Gregory was in great fear that he would have to depart from life unbaptized. He prayed for a little respite. While he was in agony, his parents were suffering with him and were participating in his peril through a nocturnal vision. They brought help to him from the land, as if enchanting the waves through prayer. In a vision another passenger, a boy, seemed to see Gregory's mother enter the water, seize the ship, and without great effort draw it to the land. After the sea had become quiet, the ship reached Rhodes, and the passengers fulfilled a vow they had made in their time of fear³⁴⁹.

³⁴²Hieronymus, *Vita Sancti Hilarionis Eremitae* 40 (Migne, P. L., 23.49-50).

³⁴³Gregory of Tours, *Vitae Patrum* 17.5 (Migne, P. L., 71.1083).

³⁴⁴Gregory of Tours, *Liber De Gloria Confessorum* 46 (Migne, P. L., 71.863). Compare a somewhat similar appeal of Saint Martin in the same author's *De Miraculis S. Martini Liber Primus* 2 (*ibidem*, 916).

³⁴⁵Gregory, as cited in the first reference given in the preceding note.

³⁴⁶Gregory of Tours, *De Miraculis S. Martini Liber Primus* 9 (Migne, P. L., 71.922-923).

³⁴⁷Compare *Aeneid* 1.106-107 *Hi summo in fluctu pendent, his unda dehiscens terram inter fluctus aperit*. . . . The passage in Gregory contains other Vergilian coloring.

³⁴⁸Compare Migne, P. L., 71.779 . . . *per illum antennae quae modulum crucis gestabat apparatus*. . . .

³⁴⁹Gregory Theologus, *Oratio* 18.31 (Migne, P. G., 35.1024-1025). The same story is told in *Vita Sancti Gregorii* 33-36 (*ibidem*, 165-167).

We have seen that amid the dangers of the sea prayers were addressed both to the pagan gods and to the Christian Deity. On several occasions there was a contest between them³⁵⁰, but I shall give only one example³⁵¹. During a storm, as a ship was approaching Italy, the pagans aboard began to beseech their deities, Jupiter, Mercury, Minerva, and Venus. The only Christian called upon God. When death was imminent for all, he told the pagans that, if they wished to be saved, they should ask Saint Nicetius to intercede for them. This they did, whereupon the sea became peaceful, the wind fell, and the sun came out.

Another resource amid dangers at sea was the use of relics. A presbyter who was returning from a mission with some relics of saints was overtaken on Lake Geneva by a storm which raised the billows mountain-high. This storm, too, is described with Vergilian touches: . . . *ad sidera surgunt undarum montes, et nunc puppis naviculae, prora dehiscence, fertur in altum, nunc iterum, demersa puppe, prora tollitur in sublime*³⁵². When the presbyter was already being covered by spray from the waves, he confidently held out the relics before them and called upon the glorious martyrs for protection. The wind ceased, the waves went down, and the ship reached shore³⁵³.

An interesting story is told of storms on the Adriatic Sea after Helena, the mother of Constantine the Great, is said to have discovered in Palestine the tomb of the Savior and the Holy Cross. The waves were in commotion and there were frequent tragedies, so that this sea acquired the name *vorago navigantium*. Moved to pity by the deaths of seamen, Helena had one of the four nails from the cross thrown into the deep. At once it became calm, and gentle breezes were given to the sailors. Gregory says: *Unde usque hodie nautae sanctificatum mare venerantur cum ingressi fuerint, jejuniis, orationibusque et psallentio vacant*³⁵⁴.

Even a restricted area of the sea may be lulled. Before his death Cerbonius, Bishop of Populonium, who had sought refuge on Elba when the Langobards were overrunning Italy, expressed a desire to be buried in the tomb which he had prepared for himself in Populonium. As his body was being transported thither, clouds gathered and broke in a terrible rain-storm. The fury of the storm encircled the boat, but not a drop of rain fell on it³⁵⁵.

In Christian lore, as in pagan, we read of the sending of favorable breezes and the divine directing of winds. A deacon (*diaconus*) who was entrusted with the transfer of some relics of the saints was escorted to the harbor of Rome by Pope Pelagius. He embarked on a ship which carried a small cross on a yard. As they were nearing Massilia, a strong wind began to carry the vessel toward a dangerous promontory. The deacon thereupon raised the relics of martyrs and called upon all the martyrs by name. In response a stronger wind

³⁵⁰See THE CLASSICAL WEEKLY 18.165 A for an incident in the life of Porphyrius. I shall give other examples in a future paper.

³⁵¹Gregory of Tours, *Vitae Patrum* 17.5 (Migne, P. L., 71.1083).

³⁵²Compare Vergil, *Aeneid* 1.103-105.

³⁵³Gregory of Tours, *Miraculorum Liber I De Gloria Martyrum* 76 (Migne, P. L., 71.772-773).

³⁵⁴*Ibidem*, 6 (Migne, P. L., 71.710).

³⁵⁵Gregory the Great, *Dialogi* 3.11 (Migne, P. L., 77.238-239).

from the opposite direction beat back the hostile wind and carried the ship to the safety of deep water³⁵⁶.

In the neighborhood of Nicaea (in Liguria) there died in 581 A. D. a devoted servant of God named Hospitius. A man picked up a handful of dust beside his tomb and wrapped it in linen. On the next day he embarked upon a ship bound for Massilia, although he wished to go only to the monastery on the Island of Lirinus. When the ship finally reached a point opposite his destination, it stopped still in the midst of the sea, although winds were blowing. When the Jews who owned the vessel were astounded, the Christian explained the situation thus:

'I have with me the relics of the blessed Hospitius, and now I desire to go to Lirinus, a thing I was afraid to tell you. Now, however, I know that your ship is held fast by his holiness, nor will it be able to move forward from here unless you consent to go where I intended'.

When they agreed and changed the position of the sails, a favorable wind carried them to the island, whereupon they were free to go where they wished³⁵⁷.

On a day on which ceremonies were being held in honor of the martyr Genesius a bridge which had been built across the Rhone upon boats began to give way at a point in the stream where the martyr is said to have swum. The people upon it prayed to the martyr to save them by his holiness. At once a wind sprang up and carried them to shore and safety³⁵⁸.

Contrast the behavior of the specter-ship in Coleridge, *The Rime of the Ancient Mariner*³⁵⁹:

The loud wind never reached the ship,
Yet now the ship moved on!

RECOGNITION THAT GODS DO NOT CONTROL THE WAVES AND STORMS AT SEA

In the anecdotes told of Diagoras and Bias³⁶⁰ there is clear evidence that some of the ancients did not believe in the supernatural origin of storms at sea. To the number may be added Cyrus the Elder³⁶¹, who thought it impious that those who had not learned how to steer a ship should expect their prayers to save ships when they took the helm. Gregory Theologus³⁶² compares persons who are wise when there is no emergency, but who fail in time of need to men who boast of their skill as pilots, yet lay aside the rudder when a storm arises. A shrewder pilot is he who prays and invokes his tutelary demons when he sees signs of storms, but does not neglect to hold to the rudder and let down the main yard³⁶³.

As early as Homer it was noted that in spite of the gods winds might tear a ship to pieces³⁶⁴. Lucretius³⁶⁵ reminds his readers that, while a violent storm is sweeping over the sea, the prayers of the commander of

an expedition that contains mighty legions and elephants do not save ships from destruction upon shoals. When Diagoras, who was called Atheist, was at Samothrace, there were pointed out to him as proof of the intervention of the gods during storms at sea the votive offerings of those who had been saved, but he commented: 'They would be far more numerous if those who lost their lives had also set up offerings'³⁶⁶. Ships with such euphemistic and auspicious names as *Bon Voyage*, *Providence*, and <Divine> *Attendance* were overturned by storms³⁶⁷.

Since ridicule often accomplishes more than learned argument, perhaps Lucian did as much as any other individual philosopher to bring divine meteorology into disrepute. He represents one seafaring man as petitioning Zeus for a north wind and another for a south wind, while farmers were praying for rain and washerwomen for sunshine³⁶⁸.

After leaving the openings through which the prayers had ascended to his abode in the heavens Zeus, says Lucian, gave the following orders³⁶⁹:

... "Let there be rain to-day in Scythia, lightning in Libya, snow in Greece. North Wind, blow in Lydia. South Wind, take a day off. Let the West Wind raise a storm on the Adriatic, and let about a thousand bushels of hail be sprinkled over Cappadocia."

MODERN EXAMPLES

It would seem that in this age of steam and oil urgent need for favorable winds should have departed, but the following extracts from a modern story of the sea³⁷⁰ shows that contemporary sailors whistle for them as ardently as ancient seamen prayed for them:

While the man at the wheel stood motionless in the bright moonlight, while the man on the fore-castle stood statue-still, the mate leaned on the taffrail and softly whistled for a wind...

... All night the mate or second mate softly whistled for a wind...

... Paying no attention, the mate leaned on the taffrail and softly whistled for a wind...

... Always, night and day, one or other of the mates softly whistling for a wind...

In the *Golden Legend*³⁷¹, Longfellow makes the padrone say:

Only a little while ago
I was whistling to Saint Antonio
For a capful of wind to fill our sail,
And instead of a breeze he has sent a gale.

The modern association of the albatross with favorable winds is not less implicit than the ancient belief in halcyon days. In an account of a voyage in the southern Atlantic I find the following sentence³⁷²:

Some of the seamen were distinctly uneasy, swearing

³⁵⁶Gregory of Tours, *Miraculorum Liber I De Gloria Martyrum* 83 (Migne, P. L., 71.779). For another example of change of wind to the opposite direction by divine agency see Gregory of Tours, *De Miraculis S. Martini Liber Secundus* 17 (Migne, P. L., 71.948). See also note 71, above.

³⁵⁷Gregory of Tours, *Liber De Gloria Confessorum* 97 (Migne, P. L., 71.900).

³⁵⁸Gregory of Tours, *Miraculorum Liber I De Gloria Martyrum* 69 (Migne, P. L., 71.766-767).

³⁵⁹Part V, Stanza 9.

³⁶⁰See the text connected with notes 225-226, above.

³⁶¹Xenophon, *Cyropaedia* 1.6.6.

³⁶²Oratio 26.9 (Migne, P. G., 35.1240).

³⁶³Plutarch, *Moralia* 169 B. Compare 1103 C-D.

³⁶⁴Odyssey 12.288-290. ³⁶⁵5.1226-1232.

³⁶⁶Diogenes Laertius, *Diogenes* 6.59. Compare Cicero, *De Natura Deorum* 3.89. Other examples of ancient disbelief in popular weather lore are given in *THE CLASSICAL WEEKLY* 25.216. See also 18.157 A.

³⁶⁷Plutarch, *Moralia* 1057 E.

³⁶⁸Icaromenippus 25. I have wondered whether in the Play of the Wether John Heywood owes anything to this passage in Lucian. ³⁶⁹*Ibidem*, 26. The translation is that of A. M. Harmon, in *The Loeb Classical Library*.

³⁷⁰Bill Adams, *Calm*, *The Atlantic Monthly* 148 (1931), 791-794, *passim*.

³⁷¹For other examples see A. S. Rappoport, 89-91 (see note 279, above).

³⁷²G. F. Simmons, *Sinbad's of Science*, *The National Geographic Magazine*, 52 (1927), 37.

we would be trailed by disaster if we killed the bird that made the breeze blow fair. . . .

Of course, this reminds one of certain verses in Coleridge, *The Rime of the Ancient Mariner*³⁷³:

And I had done a hellish thing,
And it would work 'em woe:
For all averred, I had killed the bird
That made the breeze to blow.
Ah wretch! said they, the bird to slay,
That made the breeze to blow!

It has been ascertained that this part of Coleridge's poem is founded on an incident of an actual voyage around Cape Horn by Captain Shelvocke. A second captain shot an albatross in the belief that it was of ill omen³⁷⁴:

. . . That which, I suppose, induced him the more to encourage his superstition, was the continued series of contrary tempestuous winds, which had oppress'd us ever since we had got into this sea. But be that as it would, he, after some fruitless attempts, at length, shot the *Albitross*, not doubting (perhaps) that we should have a fair wind after it.

MODERN REFERENCES

We have seen that many of the beliefs of both Biblical and pagan writers have counterparts in the writings of the Church Fathers. Christianity, however, does not seem to have lessened the credulity of sailors and seamen of Europe in regard to weather lore. Many ancient ideas about the weather will be recognized by one who reads a chapter called *Winds and Storms* in A. S. Rappoport, *Superstitions of Sailors*³⁷⁵. Another interesting chapter, called *The Storm-Raisers*, is to be found in F. S. Bassett, *Legends and Superstitions of the Sea and of Sailors in All Lands and at All Times*³⁷⁶. See also William Allingham, *Weather Signs and How to Read Them. For Use at Sea*³⁷⁷; W. Gregor, *Weather Folk-lore of the Sea, Folk-Lore 2* (1891), 468-482; H. Gaidoz et E. Rolland, *Les Vents et Les Tempêtes en Mer, Melusine, 2* (1884-1885), 184-189 (see note 194, above).

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CLASSICAL ARTICLES IN NON-CLASSICAL PERIODICALS

III

The Scientific Monthly—January, *Flying Through the Ancient Near East*, Charles Breasted [a "Science Service Radio Talk"]; February, *Salient Theorems of the Theory of Groups and Their History*, G. A. Miller; March, *Grasses and Man*, Morris Halperin ["Human life has been and is more dependent upon grasses than upon any other group of living things"].
The Symposium—January, Long critical review, unfavorable, by F. A. Spencer, of Arthur Weigall, *Sappho of Lesbos: Her Life and Times*; Review, favorable, by Philip Wheelwright, of T. E. Shaw, *The Odyssey of Homer* (translated).

³⁷³Part II, Stanza 3.

³⁷⁴J. L. Lowes, *The Road to Xanadu*, 224-228 (Boston and New York, Houghton Mifflin Company, 1927).

³⁷⁵65-93 (see note 279, above).

³⁷⁶101-147 (Chicago and New York, Belford, Clarke and Co., 1885). Unfortunately, bad errors are distressingly frequent throughout this book.

³⁷⁷Glasgow, J. Brown and Son, 1912.

The Virginia Quarterly Review—January, *Three Fables*, John Gould Fletcher ["I. The Garden of Epicurus"]; April, Review, favorable, by John C. Metcalf, of John Buchan, *Julius Caesar*.

The Yale Review—Spring (1933), Review, favorable, by Archibald MacLeish, of T. E. Shaw, *The Odyssey of Homer* (translated).

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IV

House and Garden—July, *Architecture that Came from Athens*, Sylvia Starr and Joseph B. Wertz [the article is accompanied by twelve photographic illustrations].

Mercure de France—June 15, *Lettres Antiques*, Mario Meunier [this article comprises reviews, all favorable, of Jean Larnoc and Robert Salmon, *Sappho, Prêtresse d'Aphrodite*, George Méautis, *L'Ame Hellénique d'après les Vases Grecs*, A. Delatte, *La Catoptronomie Grecque et ses Dérivés*, and A. Delatte, *Faba Pythagorae Cognata*].

The Nation—June 14, Review, unfavorable, by Catherine Bauer, of Albert F. Bemis and John Burchard, 2nd, *The Evolving House: A History of the Home*; Review, qualifiedly favorable, by Paul Shorey, of Gilbert Murray, *Aristophanes*; June 21, Review, favorable, by S. K. Ratcliffe, of Rebecca West, *St. Augustine*; August 2, Review, favorable, by Irwin Edman, of A. E. Taylor, *Socrates*; Review, unfavorable, by Irwin Edman, of Arthur K. Rogers, *The Socratic Problem*.

The Quarterly Review—July, *Julius Caesar: Man or Superman?*, R. S. Conway [this article, of considerable length, opposes the extravagant idolization of Caesar as exemplified by John Buchan's book, *Julius Caesar*, and, in a Postscript, agrees with certain points of view expressed in Guglielmo Ferrero's book, *The Life of Caesar* (translated by A. E. Zimmerman)]; Brief review, favorable, anonymous, of Gilbert Sheldon, *The Transition from Roman Britain to Christian England*, A. D. 368-664; Brief review, favorable, anonymous, of Gilbert Murray, *Aristophanes*.

Revue Critique d'Histoire et de Littérature—January, Review, favorable, by J.-G. Février, of J. Friedrich, *Kleinasiatische Sprachdenkmäler*; Review, favorable, by A. Ernout, of H. Sjögren, M. Tulli Ciceronis *Ad Atticum Epistolarum Libri XVI*, *Fasciculus Tertius*; Review, favorable, by A. Ernout, of André Boulanger, *Cicéron, Discours, Tome IX*; Review, mildly unfavorable, by Hubert Pernot, of Yves Béquignon, *Les Guides Bleus: Grèce*; Review, generally favorable, by Étienne Gilson, of Fritz-Joachim von Rintelen, *Der Wertgedanke in der Europäischen Geistesentwicklung <sic!>, Teil I*.

La Revue de Paris—July 1, *L'Histoire*, A. Albert-Petit [this article contains a review, generally favorable, of L. Homo, *L'Empire Romain*].

Revue Historique—March-April, *Bulletin Historique: Histoire des Religions: Judaïsme et Christianisme Antiques*, Ch. Guignebert [a bibliographical study];



Greek and Roman Weather Lore of Two Destructive Agents, Hail and Drought

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Reviewed work(s):

Source: *The Classical Weekly*, Vol. 28, No. 1 (Oct. 1, 1934), pp. 1-7

Published by: [Classical Association of the Atlantic States](#)

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The Classical Weekly

VOLUME XXVIII, No. 1

MONDAY, OCTOBER 1, 1934

WHOLE No. 745

GREEK AND ROMAN WEATHER LORE OF TWO DESTRUCTIVE AGENTS, HAIL AND DROUGHT¹

I. INTRODUCTORY

During the last few years considerable material has been published on Roman farms and Roman farming². The subject is deserving of thorough study by some specially equipped scholar. This paper, which is primarily intended to be a continuation of my studies of Greek and Roman weather lore³, is also incidentally a contribution to the growing literature on farm life. In previous papers I devoted not a little space to agricultural weather signs and lore⁴.

Had departments of agriculture existed in antiquity, they would probably have tabulated the annual losses

caused by hail and drought and would have concluded with recommendations of ways by which to lessen their destructiveness. The figures would have been interesting⁵, but, if we had a chance to exchange for a series of government reports our present scattered records of the ravages of hail and drought and the struggle against them in many countries through many centuries, I should vote against the exchange. Our extant records are personal; they reveal the thoughts and the feelings of the people as they watched their hopes and their crops maturing or being blasted by the elements.

I have had frequent occasion in previous papers to mention both hail and drought. In this paper I shall repeat only such items as are necessary for a unified and comprehensive picture. Cross-references will be given to other pertinent passages.

II. HAIL

A RELENTLESS THOUGH IRREGULAR VISITOR

The crops of the farmer have always been exposed to peril. They have ever been in danger from insects, diseases, and the elements, and from the ravages of armies, but among the agricultural population of Greece and Italy in antiquity there was no greater source of anxiety than hail. The products of thrift and toil might be destroyed in a few minutes by pelting missiles from the clouds. One visitation might make the difference between sufficiency and want in a farmer's family. From planting to harvest the menace of hail was ever present. Hail was *dira*⁶, *horrida*⁷, *immitis*⁸, *ἀσπερος*⁹, *ἀτρήη*¹⁰. It was an evil against which foresight proved of little avail¹¹. Prayer and magic were the only resources left; even they did not always provide protection. Fortunately, unlike drought, hail ravaged comparatively small areas, so that it never caused nation-wide calamity and suffering, except when it was one of the seven plagues of Egypt¹².

"Hail regions" are often spoken of—districts where hail is said to be common. There are such regions; the lay of the land makes air currents which are favorable to the creation of updrafts that make violent thunderstorms. In addition, the topography of hail regions favors the presence of cold air levels that are not too high¹³.

Such a hail region was a field that belonged to Greg-

¹The following abbreviations are used in the notes to this paper: Bellucci = G. Bellucci, *La Grandine nell' Umbria* (Perugia, Unione Tipografica Cooperativa, 1903); Breysig = A. Breysig, *Germanici Caesaris Aratea Cum Scholiis* (Berlin, G. Reimer, 1867); C. W. = *THE CLASSICAL WEEKLY*; Fiedler = W. Fiedler, *Antiker Wetterzauber*, *Würzburger Studien zur Altertumswissenschaft*, Erstes Heft (Stuttgart, W. Kohlhammer, 1931); Frazer, *The Magic Art* = Sir James G. Frazer, *The Magic Art and the Evolution of Kings* (London, Macmillan, 1917); Migne, P. G. = Migne, *Patrologia Graeca*; Migne, P. L. = Migne, *Patrologia Latina*; Morgan = Morris Hickey Morgan, *Greek and Roman Rain-Gods and Rain-Charms*, *Transactions and Proceedings of the American Philological Association* 32 (1901), 83-109; Pliny = Plinius, *Naturalis Historia*; Prog. Rel. = *Prognosticorum Reliquiae*, pages 41-54 in Breysig (see above); Th. = Theophrastus.

The letters A, B, C, and D following page references to C. W. (= *THE CLASSICAL WEEKLY*) indicate the upper half of the first column, the lower half of the same column, the upper half of the second column, and the lower half of the same column, respectively.

²See e. g. E. E. Burris, *The Religious Life on a Roman Farm as Reflected in the De Agricultura of Marcus Porcius Cato*, C. W. 21 (1927), 27-30; John Day, *Agriculture in the Life of Pompeii*, *Yale Classical Studies* 3, 165-208 <For a review, by Dr. Moses Hadas, of this volume, which was published in 1932, see *THE CLASSICAL WEEKLY* 26.165-166. On 166 B-C Dr. Hadas gives Dr. Day's "own admirable summary of his results..." C. K.>; Tenney Frank, *Farmers or Peasants*, Chapter III in *Some Aspects of Social Behavior in Ancient Rome*, 64-91 (Martin Classical Lectures, Volume II [Harvard University Press, 1932]). <For a review, by Professor John W. Spaeth, Jr., of this book, see *THE CLASSICAL WEEKLY* 27.94-96. C. K.>; Grant Showerman, *The Farmer*, Chapter 24 in *Rome and the Romans: A Survey and Interpretation*, 251-266 (New York, Macmillan, 1931 <for a review, by Professor A. D. Fraser, of this book see *THE CLASSICAL WEEKLY* 25.198-199. C. K.>); Eugene Tavenner, *The Roman Farmer and the Moon*, *Transactions and Proceedings of the American Philological Association* 49 (1918), 67-82; *Roman Farm Management: The Treatises of Cato and Varro Done into English, With Notes of Modern Instances*, by a Virginia Farmer [= Fairfax Harrison. C. K.] (New York, Macmillan, 1913); Ernest Brehaut, *Cato the Censor on Farming*, Translated <With an Introduction and Commentary> (Columbia University Press, 1933).

³All these articles have appeared in *THE CLASSICAL WEEKLY*, as follows: *An Animal Weather Bureau*, 14 (1921), 89-93, 97-100; *The Folk Calendar of Times and Seasons*, 16 (1922), 3-7; *The Plant Almanac and Weather Bureau*, 17 (1924), 105-108; *Magic and the Weather in Classical Antiquity*, 18 (1925), 154-157, 163-166; *The Classical Astral Weather Chart for Rustics and Seamen*, 20 (1926), 43-49, 51-54; *Greek and Roman Weather Lore of the Sun and the Moon*, 22 (1928), 25-31, 33-37; *Clouds, Rainbows, Weather Galls, Comets, and Earthquakes as Weather Prophets in Greek and Latin Writers*, 23 (1929), 2-8, 11-15; *Greek and Roman Weather Lore of Winds*, 24 (1930), 11-16, 18-24, 25-29; *Classical Weather Lore of Thunder and Lightning*, 25 (1932), 183-192, 200-208, 212-216; *Weather Lore of the Sea in Greek and Latin*, 27 (1933), 1-6, 9-13, 17-22, 25-29.

⁴The most important parts of this material (see note 3, above) are to be found in *THE CLASSICAL WEEKLY* under the captions *Farming Occupations*, 16.5 D-6 B; *Farming Operations*, 17.107 A-C; *The Farmer and the Winds*, 24.20 C-21 C; *Thunder and Vegetation*, 25.201 A-203 B. Many more items are given in the paper called *The Classical Astral Weather Chart for Rustics and Seamen*, 20.43-49, 51-54.

⁵It has been estimated that in 1927 the loss caused by 298 hailstorms in the United States of America amounted to \$15,000,000. See E. E. Free and Travis Hoke, *Weather: Practical, Dramatic and Spectacular Facts about a Little Studied Subject*, 150 (New York, Robert M. McBride and Co., 1928).

⁶Horace, *Carmina* 1.2.1; Prog. Rel. 3.81, 115 (Breysig, 49, 51).

⁷Vergil, *Georgics* 1.449. ⁸Prog. Rel. 3.65 (Breysig, 48).

⁹Euripides, *Troades* 78.

¹⁰Orphei *Lithica* 597 (see note 41, below).

¹¹Compare Xenophon, *Oeconomicus* 5.18. Of course, vines were provided with strong supports to help them endure storms. According to *Geoponica* 5.45.1 a hailstorm after late pruning might affect the quality of the wine.

¹²Exodus 9.19-34.

¹³Free and Hoke, 152-153 (see note 5, above).

ory of Tours¹⁴. Year after year hail so devastated it that no produce was left upon it. Finally he took some holy wax from candles which he had brought back with him after visiting the tomb of St. Martin and placed it at the top of the tallest tree in his vineyard. After that day storms never visited his land, but passed by as if in fear.

THE DESTRUCTIVENESS OF HAIL

Perhaps no one has epitomized better than Columella¹⁵ the devastation caused by hail:

saepae ferus duos iaculatus Iuppiter imbres,
grandine dilapidans hominumque boumque labores. . . .

On reading these verses an ancient Roman would have seen in his mind's eye whole fields of grain and vegetables utterly ruined and the ground beneath olive groves covered with fruit¹⁶. Pliny the Younger would have needed no commentary upon them, for a hailstorm once destroyed all the produce on his estate in Tuscany¹⁷. In the year 373 (?) the inhabitants of Nazianzus were brought to the depth of misery when a series of misfortunes was climaxed by a hailstorm which destroyed their vines and their ripened crops¹⁸. It left the earth in a sad plight, as if its beauty had been sheared off¹⁹.

The famous medieval work on witchcraft, the Malleus Maleficarum, says²⁰ that

. . . in the diocese of Constance, twenty-eight German miles from the town of Ratisbon in the direction of Salzburg, a violent hailstorm destroyed all the fruit, crops and vineyards in a belt one mile wide, so that the vines hardly bore fruit for three years.

Shelley does not exaggerate when he represents a cloud as saying²¹ "I wield the flail of the lashing hail".

The constant fear under which the owner of a vineyard lives is shown by the following conversation between an English woman and an Italian peasant²²:

'The vines look fine,' I said.

'Yes, signora, there will be many grapes this year—but of course—when the hail comes. . . ' he shrugged his shoulders. 'Every year it comes, in July or August, and the crops are ruined. . . '

'But not *always*?' I asked.

'Every year, signora, it hails not only once, but sometimes twice, and what isn't destroyed by the first storm

is done for by the second. . . but sometimes it is not so bad, it depends on the wind. Last year only one-third of the crops were spoilt down here, but up at the fields by Campià everything was devastated. The storm is usually worst up there. You should see it, the grapes are torn from the vines and strewn on the ground, whole bunches of them, and the leaves are wrenched off, and the plants stand naked. They all suffer, the olives and the maize too. In ten minutes it is all spoilt. Goddam,' he added fiercely in English.

In spite of a procession held to avert it a hailstorm may come and wreak terrible damage, as we may see from the words of an eyewitness²³:

I saw the devastated terraces of Campià and walked down the road past the fontana to San Lorenza. Everywhere the same miserable spectacle. Half-naked vines with withered leaves scattered round about, grapes on the ground, often whole bunches of them. The edges of the torn and perforated leaves, still left on the plants, were turning brown and every grape that had been hit by a hailstone showed its bruise. The maize plants were broken, and the long leaves hung in ribbons, as if they had been combed. All the plants had the most bedraggled appearance. In places the road was thick with olive leaves and little black olives.

All this havoc had been done in ten minutes, if, indeed, the storm had lasted as long as that, and the peasants had stood watching, utterly helpless. One old man had wrung his hands and burst into tears, the others had watched with hard eyes and firmly closed lips. Why did God send these storms? they asked, hadn't everything been done that could be done? Hadn't the Madonna been carried through the streets? It was certain that God was not at fault, it must be the church then that was responsible for this, the church and the saints and the priests. The male population of Campià swore and blasphemed with flashing eyes, and the women listened, awestruck, always ready to join in when they laughed in despair.

I felt I would not like to be in the priest's shoes at this crisis.

Hailstorms were often violent enough to make some sort of shelter welcome both to man and to beast. As the clouds dropped their burden, the plowman and the farmer would flee from the fields to the protection of a bank or overarching rock, and the wayfarer would search for a similar retreat²⁴. The shepherd would even risk the displeasure of a rural deity by driving his flock beneath a shrine²⁵.

It seems that one story about hail may excel another without transgressing the bounds of truth, but Charles Darwin did have some fear that the accuracy of the following paragraphs might be questioned²⁶:

September 16th <1833>.—To the seventh posta at the foot of the Sierra Tapalguen <south of Buenos Aires> . . . We were here told a fact, which I would not have credited, if I had not had partly ocular proof of it; namely, that, during the previous night hail as large as small apples, and extremely hard, had fallen with such violence, as to kill the greater number of the wild animals. One of the men had already found thirteen deer (*Cervus campestris*) lying dead, and I saw their *fresh* hides; another of the party, a few minutes after my arrival, brought in seven more. Now I well know, that one man without dogs could hardly have

¹⁴De Miraculis S. Martini i.34 (Migne, P. L., 71. 937).

¹⁵10.329-330.

¹⁶Compare Horace, Epistulae 1.8.4-5, Carmina 1.2.1-2, 3.1.29; Ovid, Fasti 5.322 florebant segetes: grandine laesa seges <est>; Vegoia (see below, at the end of this note), as quoted by F. Blume, K. Lachmann, and A. Rudorff, Die Schriften der Römischen Feldmesser, 1.351 (Berlin, G. Reimer, 1848): Fructus saepe ledentur decutienturque imbris atque grandine. . . ; Philostratus, Heroica 77; Prog. Rel. 3.140-142 (Breysig, 52); Minucius Felix, Octavius 5-13. Theophrastus says (Historia Plantarum 4.14.1) that wild trees become liable to disease after being smitten by hail at any time from the budding to the blossoming period. Pliny (18.278: compare 17.222) describes hail as a *maior vis*, one of the greater forces of nature. The words *χαλαζοκopia* and *χαλαζοκοπέω*, as used by Theophrastus, De Causis Plantarum 5.8.2-3, are vivid commentaries on the power of hail.

On Vegoia see W. H. Roscher, Ausführliches Lexikon der Griechischen und Römischen Mythologie, under Vegoia, 6.172-173.

¹⁷Epistulae 4.6.

¹⁸Gregory Theologus, Oratio 16 (15) (Migne, P. G., 35.933).

¹⁹Ibidem (Migne, P. G., 35.941).

²⁰Malleus Maleficarum, Translated, With an Introduction, Bibliography, and Notes, by the Rev. Montague Summers, Part II, Question 1, Chapter 15, page 148 (<London>, John Rodker, 1928).

²¹The Cloud.

²²<Miss> Tony Cyriax, Among Italian Peasants, 42-43 (New York, Dutton <1919>). <For a review, by Professor W. B. McDaniell, of this book see THE CLASSICAL WEEKLY 19.229-230. C. K.>.

²³Cyriax, 192-193 (see note 22, above). For a description of the religious services see Cyriax, 120-137.

²⁴Vergil, Aeneid 10.803-808. Compare Exodus 9.19.

²⁵Ovid, Fasti 4.755-756.

²⁶The Voyage of the Beagle, Chapter 6. The work may be found in Volume 29 of The Harvard Classics (New York, P. F. Collier and Son, 1909): see pages 127-128.

killed seven deer in a week²⁷. The men believed they had seen about fifteen ostriches (part of one of which, we had for dinner); and they said that several were running about evidently blind in one eye. Numbers of smaller birds, as ducks, hawks, and partridges, were killed. I saw one of the latter with a black mark on its back, as if it had been struck with a paving-stone. A fence of thistle-stalks round the hovel <of the seventh posta> was nearly broken down, and my informer, putting his head out to see what was the matter, received a severe cut, and now wore a bandage. The storm was said to have been of limited extent: we certainly saw from our last night's bivouac a dense cloud and lightning in this direction. It is marvellous how such strong animals as deer could thus have been killed; but I have no doubt, from the evidence I have given, that the story is not in the least exaggerated. I am glad, however, to have its credibility supported by the Jesuit Dobrizhoffer²⁸, who, speaking of a country much to the northward, says, hail fell of an enormous size and killed vast numbers of cattle: the Indians hence called the place *Lalegraicalvalca*, meaning "the little white things." Dr. Malcolmson, also, informs me that he witnessed in 1831 in India, a hail-storm, which killed numbers of large birds and much injured the cattle. These hailstones were flat, and one was ten inches in circumference, and another weighed two ounces. They ploughed up a gravel-walk like musket-balls, and passed through glass-windows, making round holes, but not cracking them.

Darwin's account is further supported by the words of a recent writer²⁹:

But it is hail—not wind, lightning, or torrential rain—which wreaks havoc. Big hailstones, pounding the farms like artillery fire, not only beat crops, fruits, and vegetables to pieces, but have been known to kill sheep, young cattle, and even horses.

Hailstorm and wind combined wreak terrible destruction:

... Thus on 22nd July 1911, when the thermometer had reached 93° Fahr. in the shade, a heavy hail-storm and furious wind fell on Rome and the surrounding country. Part of the zinc roof of the railway station was torn off, the column of Victory in the grounds of the Exhibition fell, and the wall of the Sardinian pavilion was much injured. When the storm passed away, Monte Gennaro, above Tivoli, the highest summit of the Sabine Hills and so conspicuous a landmark from Rome, presented an extraordinary appearance, being covered with hail and as white as in mid-winter³⁰.

Both in the United States and in Europe hail sometimes causes the death of human beings³¹, but, so far as

²⁷Compare Psalms 78.48 He gave up their cattle also to the hail. . . .

²⁸Martin Dobrizhoffer, Jesuit missionary, lived for eighteen years (1749-1767) among Paraguay Indians, the Guaranis and the Abipones. In 1784 he published, at Vienna, an important work, in three volumes, in Latin, entitled *Historia De Abiponibus, Equestri Belli-cosaeque Paraguariae Natione*. . . . In 1822, an English translation, by Sara Coleridge, of this work appeared in London, under the title, *An Account of the Abipones* (three volumes). For the matter referred to in the text see Dobrizhoffer, 2.14 (in the original Latin edition), 2.6 (in the English translation).

For another vivid account of a devastating hailstorm, in which, it is said, beasts and many shepherds were killed, see *The Memoirs of Benvenuto Cellini*, Book 2, Section 50 (the passage may be found conveniently in the translation by Anne Macdonell, in *Everyman's Library*, No. 51, 362-364 (London, J. M. Dent, 1925). This storm occurred while the party of Cellini was a day's journey from Lyons. They "saw hailstones so big that you could not have spanned one with your two hands. . . ."

²⁹F. Simpich, *Life on the Argentine Pampa*, *The National Geographic Magazine* 64 (1933), 476.

³⁰Sir Archibald Geikie, *The Love of Nature among the Romans During the Later Decades of the Republic and the First Century of the Empire*, 247-248 (London, John Murray, 1912). For an informative chapter called *Hail and the Damage It Does* see C. F. Talman, *The Realm of the Air: A Book about Weather*, 75-82 (Indianapolis, The Bobbs-Merrill Co., 1931).

³¹Talman, 78 (see note 30, above).

I have been able to learn, there are no convincing records of such a thing in ancient Greece or in ancient Italy. It is said that Mardonius was killed by a thick hailstone after Xerxes had sent him to plunder the holy shrine of Apollo at Delphi³². It is generally stated, however, that a thunderstorm prevented this sacrilege³³.

In Agobard's time (*circiter* 779-840) there were weather magicians (*tempestarii*) who claimed that they could destroy their enemies by hailstorms, but Agobard never heard anyone testify to having seen such an event³⁴.

According to Joshua 10.11 the Lord directed death-dealing hail against the Amorites:

And it came to pass, as they fled from before Israel, and were in the going down to Beth-horon, that the Lord cast down great stones from heaven upon them unto Azekah, and they died: they were more which died with hailstones than they whom the children of Israel slew with the sword.

Another passage from the Bible (Exodus 9.19) assumes that hail may cause great loss of life among both men and beasts:

Send therefore now, and gather thy cattle, and all that thou hast in the field; for upon every man and beast which shall be found in the field, and shall not be brought home, the hail shall come down upon them, and they shall die.

HAILSTONES CALLED MISSILES

Hail falls with such force that it may be designated, as the thunderbolt is³⁵, by names that are applied to missiles and weapons. Sometimes it seems as if it is thrown, as the words *χαλαζαβόλος*³⁶ and *χαλαζαβόλεω*³⁷ suggest. The word *saxea* is used to describe a hailstorm which fell upon Caesar's legionaries³⁸. In Aristophanes³⁹ the Clouds threaten to ply their slings against the scornful. The word 'slings' is appropriate, because, as the scholiast states, hail is like a stone. In another source⁴⁰ the clouds are said to 'javelin' hail and measureless rain. In the Orphei *Lithica*⁴¹ the terrible hail with its countless missiles inflicts a 'wound' upon a field.

A great tribute is paid to the power of hailstorms when missiles are compared to them. As Mago was approaching the larger of the Balearic Islands, in 206 B. C., so great a number of hailstones poured upon him that he did not dare to enter the harbor⁴². In an extended simile in the Aeneid weapons striking about Aeneas are likened to beating hail⁴³.

THE MUSIC OF HAIL

In spite of the losses caused by storms some ears heard music in them. We are told that Vergil's verse⁴⁴,

³²Ctesias, *Persica* 56. See Friedrich Reuss, *Ktesias' Bericht über die Angriffe der Perser auf Delphi*, *Rheinisches Museum* 60 (1905), 144-147.

³³See Herodotus 8.35-39, and C. W. 25.213 C.

³⁴De Grandine et Tonitruis 7 (Migne, P. L., 104.151).

³⁵See C. W. 25.215, note 480. ³⁶Plutarch, *Moralia* 499 F.

³⁷Greek Anthology 5.64; Clemens Alexandrinus 6.3.31 (Migne, P. G., 9.248).

³⁸*Bellum Africanum* 47.1.

³⁹The Clouds 1125.

⁴⁰Pseudo-Justinus, *Quaestiones et Responsiones ad Orthodoxos* 31 (Migne, P. G., 6.1277).

⁴¹597-598. This work may be conveniently consulted in Orphica, edited by E. Abel (Leipzig, Freytag, and Prague, Tempsky, 1885).

⁴²Livy 28.37.7. Compare Ovid, *Metamorphoses* 5.158 *Tela volant hiberna grandine plura*. . . ; Silius Italicus 2.38 *et densa resonant saxorum grandine turres*. ⁴³10.802-809.

⁴⁴Georgics 1.449. Compare Apollonius Rhodius 2.1083-1086.

tam multa in tectis crepitans salit horrida grando, is "A vivid sound-imitation of the hailstorm"⁴⁵, and we are advised to "Note the accommodation of sound to sense:—so thickly rattling on the roofs dances the bristling hail!"⁴⁶

Another effective passage about hail is to be found in Horace⁴⁷: *Iam satis terris nivis atque dirae grandinis misit pater. . . .* The repetition of *-is* here is effective, whether it suggests "the fierce persistency of the storm"⁴⁸, or imitates "the wearisome *whistling* of the wind in stormy weather. . . ."⁴⁹ Perhaps we may hear the thud of striking hailstones in the forms of *contundo* which are in the perfect tense, for example, in *haud quia grando contuderit vites. . . .*⁵⁰

Columella⁵¹ vividly pictures Jupiter as grandine dilapidans hominumque boumque labores. . . . Of this verse it has been well said⁵² that "The succession of dactyls, together with the alliteration, suggests the rapid beating of the hailstones on the standing crops. . . ."

Even the language of a legal document, Codex Theodosianus⁵³, might become picturesque in describing the effect of a destructive hailstorm upon ripe grapes: . . . *ne. . . ruentis grandinis lapidatione <uvae> quaterentur.*

SIGNS OF HAIL

We have records of a few signs of the advent of hail. One of them is provided by

. . . live coals, when they outwardly brightly shine, but in their center appears, as it were, a hazy mist within the glowing fire⁵⁴.

A long-range forecast is given by Theophrastus⁵⁵:

' . . . If at the beginning of winter there is dull weather followed by heat, and these conditions are dispersed by wind without rain, it indicates that towards the spring there will be hail.'

It was supposed that on the fourteenth of May the wind from the West would be mixed with hail. The mariner was advised to steer for a safe harbor on that day⁵⁶. The winds Aparctias, Thracias, and Argestes brought hail⁵⁷. A passage from Vergil⁵⁸ seems worthy of inclusion here:

. . . quam multa grandine nimbi
in vada praecipitant cum Iuppiter horridus austris
torquet aquosam hiemem et caelo cava nubila rumpit.

Agobard makes the interesting statement that snow occurs in winter and hail in summer when the clouds are higher than usual⁵⁹. He says also that no one has ever seen hail without rain⁶⁰.

Presumably there were persons who could distinguish hail clouds from other clouds. Among them were doubtless the hail guards of Cleonae, who had to be able to detect hail clouds in order to take the proper prophylactic measures against them⁶¹.

The approach of a heavy glowing cloud meant a hail storm, a 'white storm', as it was called⁶². Vergil⁶³ says that, when the rays of the sun scatter through dense clouds at dawn or when Aurora rises with a yellow⁶⁴ light, the vines will not give the grapes enough protection from hail.

The color of clouds was another test applied by some persons. Seneca⁶⁵ pokes fun at the Stoics for believing that there were persons skilled enough to use color in identifying clouds which portended hail.

At the beginning of the eighteenth century hail clouds were recognized by their colors, according to the following quotation⁶⁶:

If the *Clouds* look Fleecy, Dusky, White inclining to Yellow, and move but Heavily, tho' the Wind be pretty Rough, the Vapours composing them are engender'd and frozen, and ratling Hail ensues.

If the *Clouds* appear of a *Whitish Blue*, and expand much, it will be small Hail or Drisling (*i. e.* frozen Mists); for that happens in the Winter or Spring, when it cannot be carried High enough to be condens'd by a greater Quantity of Cold, because the refracted Rays of the Sun are but weak, and this appears a Curdling in the *Clouds* as they Rise, and in Appearance expand themselves.

White Clouds in the Summer-time are a Sign of Hail, but in Winter-time they are a Sign of Snow, especially when we perceive the Air to be a little Warm, occasion'd by some Warm Eruptions out of the Clouds.

Peasants in Umbria have their own ways of trying to identify hail clouds. Among the signs are a whirling motion of the clouds, their rather great height, their colors, since they are of a grayish lead color below and of a gleaming white above, and their form, which resembles the great waves of the ocean. There is also the kind of cloud called 'priest's hat'⁶⁷. It is described by Italian meteorologists as 'anvil-shaped'.

The heavenly bodies, too, gave indications in regard to hail. Some stars were associated with moisture in the form of rain and others with moisture converted into frost, hail, or snow⁶⁸. The rising of the Kids and Arcturus caused hail to accompany rain⁶⁹. Arcturus brought hailstorms when it rose on the Ides of September⁷⁰. When the Dog-star rose in Taurus, there would be hail and other evils⁷¹.

The signs of the zodiac exercise influence upon the weather. Aries scatters above gloomy heights clouds that are saturated with hail and snow⁷². Pisces causes the earth to be beaten with hail⁷³.

⁴⁵See C. W. 23.4 B. ⁶²Pliny 18.356.

⁶³Georgics 1.445-449. Compare Pliny 18.342, where signs from the rising sun are given: *Purus oriens atque non fervens serenum diem nuntiāt, at hibernam pallidus grandinem.*

⁶⁴T. E. Page, 235 (see note 46, above), in a note on Vergil, *Georgics* 1.445-446 *pallida* surget Tithoni croceum linquens Aurora cubile . . . , concludes that a yellow light is described by *pallida*.

⁶⁵Naturales Quaestiones 4.6.1.

⁶⁶John Pointer, *A Rational Account of the Weather*, 109-110 (London, Printed for Aaron Ward, at the King's Arms in Little Britain, 1738).

⁶⁷Bellucci, 44-46. ⁶⁸Bede, *De Natura Rerum* 11.

⁶⁹Lydus, *De Ostentis* 7.

⁷⁰Bede, *De Natura Rerum* 11. ⁷¹Geoponica 1.8.11.

⁷²Prog. Rel. 2.1-2 (Breysig, 43). ⁷³*Ibidem*, 2.22 (Breysig, 43).

⁴⁶A Sidgwick, *P. Vergili Maronis Opera*, 2.65 (Cambridge: At the University Press, 1894). For other references to the striking of hail on roofs see Aristophanes, *Clouds* 1127; Seneca, *Epistulae Morales* 5.4.9; Apollonius Rhodius 2.1084.

⁴⁷T. E. Page, *P. Vergili Maronis Bucolica et Georgica*, 235 (London, Macmillan, 1898). ⁴⁸Carmina 1.2.1-2.

⁴⁹C. L. Smith, *The Odes and Epodes of Horace*, 7 (Boston, Ginn, 1903).

⁵⁰T. E. Page, *Q. Horatii Flacci Carminum Libri IV*, 136 (London, Macmillan, 1886).

⁵¹Horace, *Epistulae* 1.8.4-5. ⁵²10.330.

⁵³H. B. Ash, *L. Iuni Moderati Columellae Rei Rusticae Liber Decimus: De Cultu Hortorum: Text, Critical Apparatus, Translation, and Commentary*, 105 (Philadelphia, 1930). This is a University of Pennsylvania dissertation. ⁵⁴9.16.3.

⁵⁵Aratus, *Phaenomena* 1041-1043. I give the translation by G. R. Mair, in *The Loeb Classical Library*. See also Th., *De Signis* 25.

⁵⁶*De Signis* 56. ⁵⁷Ovid, *Fasti* 4.625-626.

⁵⁸Th., *De Signis* 36. ⁵⁹Aeneid 9.669-671.

⁶⁰De Grandine et Tonitruis 8 (Migne, P. L., 104.153).

⁶¹*Ibidem*, 7 (Migne, P. L., 104.151).

Planets, too, have weather associations. They indicate various things according to the signs of the zodiac in which they happen to be⁷⁴. Saturn in Scorpio brings hailstorms⁷⁵, as does Mercury⁷⁶. When Mercury is in Aries, wrathful hailstorms will be persistent⁷⁷. Its departure from the curved horns of Taurus is attended by hail⁷⁸. Hail will fall when Venus is in Aquarius⁷⁹ or in Aries⁸⁰, and will be severe if it is above Scorpio⁸¹.

Jupiter passing through the signs of the zodiac gives indications of all kinds of weather⁸². A few of the signs relate to hail. When Jupiter is in Taurus in the home of Venus, there will be much hail during the year⁸³. When it is in Gemini in the home of Hermes, hail will cause damage⁸⁴. When it is in Cancer in the home of Luna, the winter will be cold and there will be hail and dark weather, and after the spring equinox showers of hail will occur⁸⁵. There are still other signs given by Jupiter in various parts of the zodiac⁸⁶.

In the *Catalogus Codicum Astrologorum Graecorum*⁸⁷ 'brontological' and astrological signs of hail are numerous. A few examples will suffice.

Thunder in July signifies hail⁸⁸. If thunder and lightning occur while the moon is in Aquarius, much hail will fall in the land of the Saraceni⁸⁹. If the moon is waning while it is in Virgo, in the month of August, hail will fall in abundance⁹⁰.

If the moon is in Aries on June 15, there will be mist, thunder, hail, and damage to trees from violent winds⁹¹. If it is in Taurus on July 20, there will be snow and much hail in some places⁹². If a mist falls in the month of December while the moon is in Sagittarius, hail will destroy the crops⁹³.

Signs of all kinds of weather are given in these astrological catalogues. They doubtless reflect the desire of astrologers to cater to the interests of the agricultural population.

MAGIC, RELIGION, AND HAIL

Since hail was so destructive, it was natural for the ancients to resort to any means which afforded the slightest prospect of protection against it. Pausanias⁹⁴ had seen men employing sacrifices and spells against hail, but he does not preserve the formulas they used. In Italy, too, incantations, which in some respects are not unlike prayers, were frequently used in an effort to avert hail, but, whereas the prayers uttered at the Suovetaurilia were beautiful and dignified, the incantations against hail with which Pliny⁹⁵ was familiar were so obviously trivial and unworthy of consideration that he would not repeat them. His refusal to

incorporate them in his work places them low in the scale of respectability.

Doubtless the figurative language in the epigram which attributed to the bard Orpheus the power of lulling to sleep the howling winds and the hail and the drifting snow and the roaring sea was suggested by the belief in incantations⁹⁶.

Pythagoras had the reputation of being able to quell violent winds and hailstorms, but we are not informed how he did it⁹⁷.

Part of a Christian charm against hail and storms in general, written in a ninth-century hand, runs as follows⁹⁸:

...Conjuro vos conjuro vos conjuro vos demones, Satane, per Patrem et Filium et Spiritum sanctum, et vos conjuro per Trinitatem et sanctam Mariam ✠, conjuro vos per omnes angelos et archangelos, conjuro vos per quatuor ewangelistas Matheum Marcum Lucam et Johanem, conjuro vos per omnes sanctos Dei, ut non habeatis potestatem in isto loco, in campis istis aut in uvis istis petras admittere nec tempestatem ascendere nec descendere nec pluviam valentissimam nocentem. Sedite et discedite in desertum locum vel in mari ut non habeatis potestatem nullum malum hic facere. . . .

The ability to control all kinds of weather was attributed to Empedocles⁹⁹. Among his powers was that of causing hail and wind to cease¹⁰⁰. Medea was another weather wizard. She could drive away clouds¹⁰¹. This doubtless means that she could prevent both hail and excessive rain.

When threatening clouds were approaching, fires were burned in vineyards in order to dispel them¹⁰². Perhaps the smoke made it unpleasant for the demons of the clouds¹⁰³.

A mixture of sulphur, bitumen, juice of panax, acanthus, galbanum, salt, and many other things was ignited to accomplish magical results, among them the putting to flight of demons and the preventing of hailstorms. The virtue of the concoction is ascribed to its odor¹⁰⁴.

Could a heavy smoke screen, even if formed with the aid of bitumen, have been of any possible value in shielding a vineyard or other plot from hail? Ancient vineyardists saved their crops from frost by burning straw and dried manure¹⁰⁵. California orchardists burn a heavy crude oil among their orange and lemon groves on cold nights. Without attempting to answer the question I have raised I quote from an article called *Forests and Forestry*¹⁰⁶, in the *Encyclopaedia Britannica*¹⁰⁷:

... The difference in the temperature of the air in the forest and open field is the cause of air currents from the forest into the field and reverse. These movements facilitate the formation of dew and fogs over fields ad-

⁷⁴*Ibidem*, 2.23-28 (Breysig, 44).

⁷⁵Servius on Vergil, *Georgics* 1.336. Compare *Prog. Rel.* 2.27 (Breysig, 44).

⁷⁶*Prog. Rel.* 3.128 (Breysig, 51).

⁷⁷*Ibidem*, 3.114-116 (Breysig, 51).

⁷⁸*Ibidem*, 3.119-120 (Breysig, 51).

⁷⁹*Ibidem*, 3.71 (Breysig, 48).

⁸⁰*Ibidem*, 3.81 (Breysig, 49).

⁸¹*Ibidem*, 3.61-65 (Breysig, 48).

⁸²*Geoponica* 1.12.

⁸³*Ibidem*, 1.12.11. Compare *Prog. Rel.* 3.147-148 (Breysig, 53).

⁸⁴*Geoponica* 1.12.17.

⁸⁵*Ibidem*, 1.12.18.

⁸⁶*Ibidem*, 1.12.24, 28, 29, 38.

⁸⁷Brussels, H. Lamertin, 1898 (Ten volumes of the *Catalogus... Graecorum* have appeared. Others are to be published).

⁸⁸*Catalogus... Graecorum*, 8, Part 3, 124.

⁸⁹*Ibidem*, 170.

⁹⁰*Ibidem*, 8, Part 3, 187.

⁹¹*Ibidem*, 170.

⁹²*Ibidem*, 8, Part 3, 187.

⁹³*Ibidem*, 8, Part 3, 187.

⁹⁴17.267. . . mira quaedam excogitante sollertia humana, quippe cum averti grandines carmine credant plerique, cuius verba inserere non equidem serio ausim. . . . See also 28.29, 37.124.

⁹⁶Greek Anthology 7.8.

⁹⁷Iamblichus, *De Vita Pythagorica* 135.

⁹⁸S. B., Un Sermon sur la Superstition, in *Méusine, Recueil de Mythologie, Littérature Populaire, Traditions et Usages*, 3 (1886-1887), 219. This incantation was found "sur les gardes d'un manuscrit des Épîtres de saint Paul qui provient peut-être de Luxeuil (Bibl. Nat. de Paris, *Ms. lat.* 10, 440)".—I have been unable to identify "S. B."

⁹⁹See Fiedler, 22, where many references are given.

¹⁰⁰Iamblichus, *De Vita Pythagorica* 135.

¹⁰¹See C. W. 18.156 C.

¹⁰²Pliny 18.293; Palladius 1.35.1.

¹⁰³See Fiedler, 27.

¹⁰⁴Vegetius, *Ars Veterinaria Sive Mulomedicina* 1.20.1-3.

¹⁰⁵See C. W. 17.108 D.

¹⁰⁶By R<alpha> Z<on>.

¹⁰⁷Fourteenth edition, 14.500.

joining forests. In the spring and autumn, these fogs save the fields from early frosts and in the summer from damage by hail. Repeatedly and in different countries it has been observed that forests prevent hail falling over the fields adjoining the forest. Coniferous forests have the greatest effect in deflecting hail storms. Statistics collected for 20 years, from 1877 to 1897, by a company insuring against hail, confirm the fact that forestless regions are subject to hail storms very frequently, while in forested regions hail storms are of very rare occurrence.

Stones, too, were employed against hail¹⁰⁸. In the complex concoction which was burned to drive away demons and hail¹⁰⁹ there were included numerous objects described as *lapides*, for example, gagates, haematites, siderites, and argyritis.

There was a stone called chalazites, which the finder was advised to keep. If one were to strike it with iron in the direction in which a hailstorm was coming, the storm would be turned away¹¹⁰. Doubtless the noise was supposed to frighten the demons of the storm¹¹¹, but iron itself was efficacious; there was a common belief that demons feared it¹¹².

Pliny¹¹³ holds up to ridicule *magi* who believed that they could drive away hail and do other things by the aid of amethysts if a prayer (doubtless an incantation) should be added.

Noise made by striking bronze was regarded as effective in driving away the demons that were devouring the sun and the moon during eclipses¹¹⁴. Noise was employed also, to some extent, against thunder¹¹⁵. I do not know when the use of bells against hail began, but the custom of baptizing them and ringing them to drive away demons of the storm had become firmly fixed by Charlemagne's time, for a Capitulary of his forbids the practice¹¹⁶.

From the Middle Ages to the present time sacred and consecrated bells have been used in Europe to drive away storms¹¹⁷. An inscription on a bell at Hasle in Switzerland reads: "A fulgure grandine et tempestate libera nos domine Jesu Christe"¹¹⁸. In the Province of Umbria in Italy there are bellmen whose duty it is to ring the bells not only to put storms to flight, but to summon the inhabitants to vigilance and prayer. Hail can be kept out of the territory of a parish if the bell is sounded in time. Obviously the responsibility

of the bellman is heavy. He is blamed for damage to crops when he is tardy or is supposed to have been tardy. The successful watcher is rewarded with heaps of produce for himself and his family, but in case of failure he dares not risk his well-being among disappointed harvesters, from whom he would receive nothing but threats and insults¹¹⁹.

On reading of the perils of this office I suspected that the occupation of the hail guards in antiquity was not an enviable one, but I was surprised to find a record to that effect. Seneca¹²⁰ tells us that Cleonae was strict in dealing with warders through whose negligence vineyards had been beaten down and crops destroyed.

For several centuries explosives have been used in Southern Europe in an effort to protect vineyards from hail¹²¹. According to an item in The Ann Arbor Daily News, September 12, 1928, there are still scientists who think that shooting may be made effective for such purposes:

Swiss scientists recently fired high explosive rockets at the clouds to discourage a hailstorm that was headed for the crops along the Swiss-French frontier. Observers differed as to the value of this means of defense after the bombardment was over.

A more informative passage is to be found in a book on Italian private life¹²²:

...Hail is another curse to the Italian farmer, especially in the North. A hail-storm lasting half an hour may destroy the fruits of months of labour, and its ravages are so extensive that hitherto insurance companies have refused to insure against it. But it is believed that a preventive has at last been found. Cannons shaped like sugar-loaves, loaded with a special kind of pyrite powder, are discharged when storms are threatening, and the hail descends in consequence in the form of fine snow or sleet. Syndicates subsidised by the Government have been formed in the districts most affected, to purchase the necessary implements. In stormy weather a stranger in Northern Italy would think himself on a battle-field from the noise of artillery which he hears all around him.

It seems that grapes were in special danger from the elements between the time when they were fully formed and the vintage. Varro¹²³ wanted the rustic Vinalia on August 19 set apart for religious services to lessen the power of storms. W. Warde Fowler¹²³ is inclined to think that the *auspicio vindemiae* is to be associated with this festival.

Ceremonies like that of the Auspicio, intended to avert from crops the perils of storm or disease, are known sometimes to take place when the crops are still unripe.

¹¹⁹Bellucci, 49-53. In the text I am retaining the present tense of my source, since there is no reason to believe that there has been any change in the customs of the peasants since Bellucci published his book in 1903.

¹²⁰Naturales Quaestiones 4.7.2.

¹²¹Bellucci, 65-72; Sir James G. Frazer, Journal and Proceedings of the Royal Society of New South Wales, 16 (1882), 12; E. Samter, Volkskunde im Alt Sprachlichen Unterricht: I. Teil, Homer, 86 (Berlin, Weidmann, 1923); Talman, 80 (see note 30, above). A battery of five curious cannon for use against hailstorms is illustrated by Free and Hoke, on the Plate facing page 288 (see note 5, above).

¹²²As quoted by Pliny 18.289.

¹²³The Roman Festivals of the Period of the Republic, 205-206 (London, Macmillan, 1916). On page 206 Fowler quotes Vergil, Georgics 2.419 et iam maturis metuendus Iuppiter uvis. Codex Theodosianus 9.16.3 is not less informative: Nullis vero criminibus implicanda sunt remedia humanis quae sita corporibus aut in agrestibus locis ne maturis vindemiis metuerentur imbres aut ruentis grandinis lapidatione quaterentur.

¹⁰⁸C. W. 18.163 D.

¹⁰⁹See the text connected with note 104, above.

¹¹⁰Geoponica 1.14.1. I am using here the reading of the edition of the Geoponica by Peter Needham (Leipzig, 1781), which is entirely different from the reading given by H. Beckh (Leipzig, Teubner, 1895).

¹¹¹See Fiedler, 28, 30, 91.

¹¹²Scholast Q on Homer, Odyssey 11.48. ¹¹³37.124.

¹¹⁴See K. F. Smith, The Elegies of Albius Tibullus, 347-348 (New York, American Book Company, 1913).

¹¹⁵See C. W. 25.207 C.

¹¹⁶Monumenta Germaniae Historica, Legum Sectio II, Capitularia Regum Francorum, volume 1, page 64, line 26: Ut cloccas non baptizent nec cartas per peticas appendant propter grandinem. This is explained as follows at the foot of the page: "Ne campanarum baptismum propter grandinem avertendam fiat et ne cartae quibus signa vel verba magica inscripta sunt in arboribus vel peticis appendantur".

¹¹⁷See the example in the long quotation in C. W. 25.208 A. Compare Leland, 217 (see note 144, below); Stemplinger, 86 (see note 118, below); A. D. White, A History of the Warfare of Science with Theology in Christendom, 1.345 (New York, Appleton, 1896).

¹¹⁸See E. Stemplinger, Antiker Aberglaube in Modernen Ausstrahlungen, 86 (Leipzig, Dieterich, 1922). Stemplinger is indebted to Carl Meyer, Der Aberglaube des Mittelalters und Nächstfolgenden Jahrhunderte, 185-186 (Basel, F. Schneider, 1884), where numerous examples of such things are given. Some bells are especially efficacious. On the varying virtues of bells see Bellucci, 55-60.

In the fruit belt of Michigan religious services for the welfare of fruit take place still earlier, for there is a blossom-week festival during which the blossoms of the trees are blessed. In *The Detroit Evening News*, July 6, 1930, it was stated that ministers "prayed for a bountiful harvest, for gentle south winds, for soft warm rains, for protection from blight".

Among the many uses of the magical circle was the averting of bad weather. As the circuit of the fields was being made at the *Suovetaurilia*, the participants invoked Mars to keep away calamities and storms¹²⁴. Doubtless hail and excessive rainfall were uppermost in the minds of the farmers who wanted protection from the elements. In fact the *nebula*, which doubtless includes the hail cloud, is one of the evils which are specifically mentioned as objects of dread¹²⁵.

Binding one grape vine with a leather thong might protect an entire vineyard¹²⁶. The material, obtained perhaps from the skin of a seal¹²⁷, may have been the chief magical power in this form of protection, but the form, that of a circle, may have been of some aid¹²⁸.

I have listed elsewhere¹²⁹ many other ways of averting hail, including those from the *locus classicus*, *Geonica* 1.14, where there occurs a summary of ancient practices. There is no need to repeat anything from this chapter, especially since it has been discussed at length in two articles by a German scholar¹³⁰.

(To be continued)

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"THERE WERE GIANTS IN THE EARTH IN THOSE DAYS"

VERGIL, GEORGICS 1.493-497

Near the end of the first book of the *Georgics* Vergil speaks sorrowfully of the Roman blood needlessly shed in the civil strife of his day and of the later times when farmers, tilling their fields, would turn up the weapons and the huge bones (*grandia ossa*) of the slain (493-497):

Scilicet et tempus veniet cum finibus illis
agricola, incurvo terram molitus aratro,
exesa inveniet scabra robigine pila,
aut gravibus rastris galeas pulsabit inanes,
grandiaque effossis mirabitur ossa sepulcris.

The possibility thus foretold has been turned into reality by a discovery recently made in Southern Italy and reported in a brief news item in *The New York Herald Tribune* (June 2, 1934):

¹²⁴Cato, *De Agri Cultura* 141.2.

¹²⁵Festus 230 (W. M. Lindsay's edition: Leipzig, Teubner, 1913): Avertas morbum, mortem, labem, nebulam, impetiginem.

¹²⁶Philostratus, *Heroica* 77.

¹²⁷Fehrle, *ΣΤΟΙΧΕΙΑ*, 17 (see note 130, below). See also *Geonica* 5.23.7-8.

¹²⁸See S. Eitrem, *Opferritus und Voropfer der Griechen und Römer*, 18 (Christiania, Jacob Dybwad, 1915).

¹²⁹See C. W. 16.6 C-D, 18.157 B, 163 A-B, D, 23.4 B.

¹³⁰E. Fehrle, *Antiker Hagelzauber*, *Alemannia* 40 (1912), 13-27, and *Studien zu den Griechischen Geonikern*, 7-26 (*ΣΤΟΙΧΕΙΑ*, *Studien zur Geschichte des Antiken Weltbildes und der Griechischen Wissenschaft*, Heft III [Leipzig, Teubner, 1920]).—The full title of *Alemannia* is *Alemannia, Zeitschrift für Alemannische und Fränkische Volkskunde, Geschichte, Kunst, und Sprache*. The reference I give in this note might also be given as Series 3, Volume 4, but 40 is the number on the backstrip, and also the most prominent number on the title-page.

Peasants ploughing near Potenza in Southern Italy found the skeleton of a soldier still wearing his helmet and the medal he won in the Second Punic War of 200 B. C. The medal is inscribed Scipio Africanus on one side and Hannibal Punicus on the reverse, showing that the warrior fought for the Roman Scipio who, having conquered Hannibal the Carthaginian, took to himself the name of Africanus. The man was nearly seven feet tall, as his skeleton proved before it crumbled into dust at the touch of the fresh air. All that then remained were the embossed helmet and the medal.

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CLAUDIANUS, DE BELLO GOTHICO 546-547

Claudianus, *De Bello Gothico*, runs as follows:

Rumpe omnes, Alarice, moras: hoc impiger anno
Alpibus Italiae ruptis penetrabis ad urbem.

This is the prophecy which a clear voice, coming from a grove, proclaimed, it was said, to Alaric. J. Koch, the most recent editor of the complete works of Claudianus (Leipzig, Teubner, 1893), noticed that the first and the last letters of the first verse, followed by the last and the first letters of the second verse, spell ROMA. He therefore printed the verses with the two final letters capitalized.

When I considered these verses carefully, I noticed another fact. If the first verse is divided into three equal parts (of twelve letters each), each part will be found to contain the anagram of ROMA: Rumpe OMnes Alarice MORAs ho ciMPigeR AnnO.

We must conclude either that we are dealing with a quadruple coincidence, or, what is more likely, that Claudianus amused or interested himself by working the name of his beloved adopted city thrice into one verse, and four times into the couplet as a whole.

HUNTER COLLEGE

HARRY L. LEVY

CLASSICAL ARTICLES IN NON-CLASSICAL PERIODICALS

I

Mercure de France—April 15, *Lettres Néo-Grecques*, Démétrius Astériotis; June 1, *D'Eschyle à Edgar Poe*, ou les Progrès de la Biographie Scientifique, André Fontainas; June 15, *Lettres Antiques*, Mario Meunier [this contains favorable reviews of Peter C. von der Horst, *Les Vers d'Or Pythagoriciens*, François Richard and Pierre Richard (translators), Sénèque: *Lettres à Lucilius*, and J. Tricot (translator), Aristote: *Metaphysique*].

Modern Language Notes—February, Chaucer and the 'Pervigilium Veneris', J. E. Hawkins [there is "at least a probability that Chaucer knew and used the *Pervigilium Veneris*" for the opening passage of the *Canterbury Tales*]; May, Review, qualifiedly favorable, by Kemp Malone, of H. M. Chadwick and N. K. Chadwick, *The Growth of Literature*, Volume I: *The Ancient Literatures of Europe*; June, A Source for <Thomas Preston's> *Cambises*, Don C. Allen ["There is no evidence in *Cambises* that Preston went to Athenaeus, but all of the events that he



Greek and Roman Weather Lore of Two Destructive Agents, Hail and Drought

Author(s): Eugene S. McCartney

Reviewed work(s):

Source: *The Classical Weekly*, Vol. 28, No. 2 (Oct. 8, 1934), pp. 9-12

Published by: [Classical Association of the Atlantic States](#)

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The Classical Weekly

VOLUME XXVIII, No. 2

MONDAY, OCTOBER 8, 1934

WHOLE NO. 746

GREEK AND ROMAN WEATHER LORE OF TWO DESTRUCTIVE AGENTS, HAIL AND DROUGHT

HAIL AN EXPRESSION OF THE DIVINE WILL

There were many circumstances under which storms were regarded as significant of the will of the gods. Thunder and lightning were generally considered ominous, but hail sometimes took equal rank as an object of fear, as we may see from a description of an encounter between the Carthaginians and the Romans at the siege of Capua, in 211 B. C.¹³¹:

... They were already engaged in skirmishing when an extraordinary storm, accompanied by an inconceivably strong wind, as well as thunder, hail, and lightning, broke from a clear sky, so that both sides were glad enough to retire, as if by mutual consent, to their original positions. They were just laying aside their arms when the sky became clear. Now although Hannibal concluded that this event, coming as it did precisely at the moment of conflict, had not occurred without divine ordering, yet he did not give up the siege, and even attempted again on a subsequent occasion to join battle.

When Hannibal was before Rome in the same year and was about to fight for the city as a prize, a heavy rain mingled with hail so confused both lines that they sought refuge in their camps. On the following day, after a similar storm had separated the combatants, the weather became wonderfully clear and calm¹³².

In the days of the prophets of the Old Testament a calamity was seized upon as an opportunity for a jeremiad calling the wrongdoers to repentance. A visitation of hail provided the Church Fathers with a similar opportunity.

In 373 the morale of the inhabitants of Nazianzus, who had experienced a number of misfortunes, was broken by a hailstorm which destroyed their mature crops¹³³. In despair they sought consolation from Gregory Nazianzenus the Elder. He was so overwhelmed by their sins that he could not speak, but his son (Gregory, surnamed Theologus) addressed them, although reluctantly. He asked them whether such blows and scourgings came haphazardly and by chance, or whether the universe was guided and controlled by reason and method¹³⁴. He represents God as saying that not even by sending hail among them and destroying their vines, fruits, and produce could he crush their wickedness¹³⁵.

He quotes ¹³⁶ Proverbs 3.12, "For whom the Lord loveth he correcteth . . ."

It seems clear from one of the Moral Poems of Gregory Theologus ^{136a} that he had seen men resorting to prayers when their welfare was being jeopardized by hail. They explained to him that they had done nothing to merit such punishment. Cyprian¹³⁷ says that scanty rainfall and destructive hailstorms are due to the displeasure of the Deity at sin.

Agobard, *De Grandine et Tonitruis* ¹³⁸, searches out the vengeful passages in the Bible in which hail is said to have been used as a means of punishment¹³⁹. He quotes Ecclesiasticus 39.35 with evident approval: Ignis, grando, fames, et mors, omnia haec ad vindictam enata sunt.

CLOUD SHIPS FROM MAGONIA

Agobard¹⁴⁰ records a weather superstition which begins in the manner of a fairy story, but almost ends in the gruesome murder of four persons. There is, he says, a land called Magonia from which come amid clouds ships to carry home crops beaten off vines by hail or destroyed by other kinds of storms. The 'sailors of the air' (*navitae aërii*), who man these ships, are in league with weather-makers, whom they reward for their efforts. On one occasion three men and a woman had the misfortune to fall from a Magonian ship and to be captured and bound by an angry crowd. Only the timely arrival of Agobard, who after much persuasion finally made truth prevail, saved the prisoners from death by stoning.

This story, fascinating in itself, becomes doubly interesting when we find it effectively used in Ekkelhard, *A Tale of the Tenth Century*, by the German writer, Joseph Viktor von Scheffel¹⁴¹. A weather wizard has been protecting a farmer's fields by praying the storms away from them¹⁴². In return for his services the farmer supplies him with grain from his farm, a method of payment which recalls the *canonicum*¹⁴³ mentioned by Agobard. But one day the farmer sees "the hailstones pelting on his fields and his young corn falling before the onslaught like soldiers in battle . . ." He is angry at the wizard for his failure to save the crops from the hag that brings the clouds. A serving-man thinks the devastation was not caused by a witch.

¹³⁶Migne, P. G., 35.956.

^{136a}Migne, P. G., 37.842.

¹³⁷*Ad Demetrianum* 7 (Migne, P. L., 4.568).

¹³⁸Migne, P. L., 104.147-158.

¹³⁹See, for example, Exodus 9.17-34; Joshua 10.11; Psalms 78.47-48; Haggai 2.17; Revelation 16.21.

¹⁴⁰*De Grandine et Tonitruis* 2 (Migne, P. L., 104.148).

¹⁴¹Chapter 18 (pages 254-256 of the translation, by Helena Easson, in *Everyman's Library*). This novel was first published in 1855. The translation was published in 1911.

¹⁴²Compare St. Augustine, in *Psalmum* 70.17 (Migne, P. L., 36.887): *Quomodo ergo <me> revocas a negotiatione? An ut agricola sim, et adversus Deum tonantem murmurem, ut grandinem timens sortilegium consulam. . . ? Sed non ea faciunt, inquis, agricolae boni.*

¹⁴³See the text preceding the mark for note 176, below.

¹³¹Zonaras 9.6. I give E. Cary's translation, in the version of Dio Cassius in The Loeb Classical Library; see 2.181.

¹³²Livy 26.11.2-4. For other examples of reading the divine will in the falling of hail, rain, and thunderbolts during military operations see Livy 40.58.3-4 and Dio Cassius 68.31.4.

¹³³Gregory Theologus, *Oratio* 16 (15) (Migne, P. G., 35.933-964).

¹³⁴Migne, P. G., 35.940.—For an interpretation of this address see De Grandinis Vastatione cum Pater Episcopus Reticeret, 5, which is to be found in Tyranni Rufini Oratorium Gregorii Nazianzeni Novem Interpretatio, pages 235-261 (see *Corpus Scriptorum Ecclesiasticorum Latinorum* 46 [Vienna, Tempsky, and Leipzig, Freytag, 1910]).

¹³⁵Migne, P. G., 35.948.

"Didst thou notice how that storm-cloud sailed over the dark heavy ones? What was it, thinkest thou? It was the Cloud-ship! Some one has sold our corn to the sailors who sail that ship."

The farmer crossed himself as if to prevent further speech, but the serving-man continued—

"My grandmother told me of it. She often heard people speak of it in Alsace when the thunder-storms came over the Odilienberg. The ship comes sailing from the land of Magonia; 'tis a white ship, and it sails over the black clouds, and Fasolt and Mermuth sit therein, and they throw the hailstones down and knock the grains of corn out of the ears, if the weather-wizard has given over his power to them. Then they gather up our corn into their air-ship and sail away home to Magonia and get well paid for it. To be friendly with them of the air-ship is a better way of working than to have masses said. We shall get nothing but husks this year."

The superstition recorded by Agobard seems to have left some traces in modern folklore. It is remarkable that a modern investigator¹⁴⁴ was told by an Italian woman that "all the clouds which we see are not clouds of air, but boats". I am quoting in full another story gathered by the same scholar¹⁴⁵:

People when they see clouds in air say it is *air* (vapour) and a sign of rain, but there is more in them than they suppose. For there is in the sky another world made by wizards and witches who, when they died, were not admitted to heaven, and so they made a world for themselves, which has a sea (lake) in it. And when the weather is dark, and clouds fly before the storm, those clouds are boats full of hail, and in them are wizards and witches, who throw the hail at one another, and so it falls to earth and does great harm. When this happens one should invoke the spirit of thunder (Tituno or Tignia).

The light, small clouds which pass along in sunlight in fine weather are small boats in which are girls and children whom the witches have taken and keep as prisoners. But sometimes when it is pleasant they send them out sailing in the air.

EFFORTS TO REPRESS STORM-MAKERS

The attitude of the law toward *tempestarii* (weather magicians) is interesting and illuminating. The Constitution of Constantine¹⁴⁶ provided for severe punishment of those who worked magic harmfully, but those who employed it in rural districts to protect grape harvests from rain and beating hailstorms were to be free from any imputation of guilt, since they were trying to preserve the gifts of heaven and the labors of men. The Interpretatio of the Code¹⁴⁷ specifies brewers of tempests as among those who are to be punished with every kind of penalty.

One of the Capitularies¹⁴⁸ of Charlemagne directs that *tempestarii* and other workers of evils be either corrected or condemned. The Church of his day took an equally strong stand¹⁴⁹:

De incantationibus, auguriis vel divinationibus et de his, qui tempestates vel alia maleficia faciunt, placuit sancto concilio, ut, ubicumque deprehensi fuerint,

¹⁴⁴C. G. Leland, *Etruscan Roman Remains in Popular Tradition*, 215 (London, T. Fisher Unwin, 1892).

¹⁴⁵*Ibidem*. Pages 211–217 are pertinent to this paper. For a remarkable story according to which persons in England saw an anchor suspended from a ship enveloped in mist or clouds see Gervasius of Tilbury, *Otia Imperialia* 1.13.

¹⁴⁶16.3. See note 123, above. ¹⁴⁷*Ibidem*.

¹⁴⁸Monumenta Germaniae Historica, Legum Sectio II, Capitularia Regum Francorum, Volume 1, page 59, No. 789, § 65.

¹⁴⁹*Ibidem*. Legum Sectio III, Volume 2, Part 1, page 209.

videat archipresbiter diocesis illius, ut diligentissima examinatione constringantur, si forte confiteantur malorum, quae gesserunt. Sed sub tali moderatione fiat eadem districtio, ne vitam perdant, sed ut salventur in carcere, usque dum Deo inspirante spondeant emendationem peccatorum.

According to a commentator on Gregory the Great, the punishment for a sender of storms should be seven years of penance, three of them on bread and water¹⁵⁰. A Capitulary of Herard¹⁵¹, Archbishop of Tours (858), would subject such an offender to public penance. A decree of Burchard of Worms¹⁵² imposed upon a person who stirred up storms, or who believed that human beings could arouse them, penance on all regular festival days throughout a year. 'Penitentials' of Irish, Anglo-Saxon, Frankish, and Roman origin generally imposed a seven years' penance on senders of storms¹⁵³.

If we may judge from the efforts of the law and the Church to suppress weather wizards, the wizards continued to be both numerous and troublesome¹⁵⁴. The cruelties practiced upon them during the Middle Ages seem to have been ineffective. The Malleus Maleficarum, published late in the fifteenth century, gives examples of the trial and the punishment of persons suspected of having caused hailstorms¹⁵⁵.

SENDERS OF HAIL

As were all the other elements, so was hail under the control of Zeus. He could both send and withhold it¹⁵⁶. As the god who could save vegetation from the menace of hail he was called Ζεὺς Χαλάζιος Σώζων¹⁵⁷.

Many human beings were supposed to be able to cause hail. The Telchines could bring clouds, rains, hailstorms, and even snow¹⁵⁸. There were also 'cloud-compellers' who resorted to enchantments to precipitate hail and boundless rain¹⁵⁹. Clement of Alexandria¹⁶⁰ records the belief of some persons that pestilences, hail, storms in general, and similar evils were due not to a material disturbance of the elements, but to the wrath of demons or angels who were ill-disposed.

In the sixth century the Church felt it necessary to combat the belief that lightning, thunder, and storms were created by the devil¹⁶¹.

Amid one celebration of the festival of St. Hildulphus (or Hildulphus) the *tempestatum ductor*, said to be the

¹⁵⁰Notae et Observationes in S. Gregorii Magni Librum Sacramentorum Auctore D. Hugone Menardo, Monacho Benedictino (Migne, P. L., 78.454).

¹⁵¹Capitula Herardi 3 (Migne, P. L., 121.764).

¹⁵²Decreta 19.5 (Migne, P. L., 140.961): Si credidisti aut particeps fuisti, unum annum per legitimas ferias poeniteas.

¹⁵³See G. L. Hamilton, Storm-Making Springs: Rings of Invisibility and Protection.—Studies on the Sources of the Yvain of Chrétien de Troies, *The Romanic Review* 5 (1914), 223.

¹⁵⁴See Hamilton, 218–224 (see note 153, above). Compare Duncange, *Glossarium Mediae et Infimae Latinitatis*, under Tempestarii, 6.527 (Paris, Didot, 1846).

¹⁵⁵144, 147–149, 188–191 (see note 20, above).

¹⁵⁶See, for example, Homer, *Iliad* 10.6; Euripides, *Troades* 78; Apollonius Rhodius 2.1083; Lucian, *Icaromenippus* 26.

¹⁵⁷See W. H. Roscher, *Ausführliches Lexikon der Griechischen und Römischen Mythologie*, 4.1285, unter Sozon.

¹⁵⁸Diodorus 5.55.3.

¹⁵⁹Pseudo-Justinus, *Quaestiones et Responsiones ad Orthodoxos* 31 (Migne, P. G., 6.1227).

¹⁶⁰Stromata 6.3.31 (Migne, P. G., 9.248).

¹⁶¹Si quis credit, quia aliquantas in mundo creaturas diabolus fecit et tonitrua et fulgura et tempestates et siccitates ipse diabolus sua auctoritate faciat, sicut Priscillianus dixit, anathema sit. The quotation may be found in J. D. Mansi, *Sacrorum Nova et Amplissima Collectio*, 9.775 (Florence, 1663). See the text connected with note 251, below.

devil, showered down so much hail that the sultry heat of fifteen days failed to melt it¹⁶².

During the Middle Ages very young girls who had been dedicated to the devil by their mothers were supposed to be able to raise up hailstorms¹⁶³.

In the duchy of Swabia a certain farmer went to his fields with his little daughter, hardly eight years old, to look at his crops, and began complaining about the drought, saying: Alas! when will it rain? The girl heard him, and in the simplicity of her heart said: Father, if you want it to rain, I can soon make it come. And her father said to her: What? Do you know how to make it rain? And the girl answered: I can make it rain, and I can make hailstorms and tempests too. And the father asked: Who taught you? And she answered: My mother did, but she told me not to tell anybody. Then the father asked: How did she teach you? And she answered: She sent to a master who will do anything I ask at any time. But her father said: Have you ever seen him? And she said: I have sometimes seen men coming in and out to my mother; and when I asked her who they were, she told me that they were our masters to whom she had given me, and that they were powerful and rich patrons. The father was terrified, and asked her if she could raise a hailstorm then. And the girl said: Yes, if I had a little water. Then he led the girl by the hand to a stream, and said: Do it, but only on our land. Then the girl put her hand in the water and stirred it in the name of her master, as her mother had taught her; and behold! the rain fell only on that land. Seeing this, the father said: Make it hail now, but only on one of our fields. And when the girl had done this, the father was convinced by the evidence, and accused his wife before the judge. And the wife was taken and convicted and burned; but the daughter was reconciled and solemnly dedicated to God, since which hour she could no more work these spells and charms.

In the Middle Ages witches were commonly accused of sending destructive hailstorms. They were formally, if unfairly and ignominiously, tried, and many of them suffered cruel deaths¹⁶⁴.

The activities of *tempestarii* are mentioned in several places in this paper¹⁶⁵. Such persons seem to have been very numerous throughout Southern Europe.

DISBELIEF IN WEATHER LORE OF HAIL

In almost all periods of classical antiquity there were at least a few voices crying out against popular ideas of magical and divine control of the weather¹⁶⁶. Both wit and humor were directed against them, but it remained for Seneca¹⁶⁷ to combine ridicule and sarcasm:

I cannot refrain from trotting out all the silly fancies of our Stoic friends. The assertion in question is that there are some people skilled in observing the clouds who foretell when a hail shower is coming on. They gather this just from experience by marking the colour of the clouds and noting which was on previous occasions followed by hail. It seems incredible that at

Cleonae there were hail-guards... appointed by the state to look out for the approach of hail. When they had given the signal that the hail was close at hand, what do you think? that people ran off to get their overcoats or cloaks? Nay, they each offered sacrifice as fast as they could, one a lamb, another a chicken. Forthwith, those clouds after getting a little taste of blood drew off in another direction. You smile! There is something to make you smile more broadly. If one had not a lamb or kid by, one laid hands upon oneself to an extent that could be done without serious damage. You must not think the clouds greedy or cruel; one merely pricked one's finger with a well-sharpened style and made atonement with this blood. The hail as invariably turned away from his little plot as from the estate of the man who prevailed upon it through the offering of greater victims.

Certain writers seek for a rational explanation of this practice. One school, adopting the only line that comports with philosophy, deny the possibility of making any bargain with hail and buying off storms by paltry presents, true, though it be, that gifts overcome even gods. Others affirm their suspicion that blood itself contains a virtue potent enough to avert and repel a cloud. But how, I ask, should a drop or two of blood possess a virtue to reach on high and influence the clouds? Is it not much easier to say, the whole thing is a parcel of lies?...

Clement of Alexandria¹⁶⁸ was scornful of persons who believed that hail and storms in general were due not to a disturbance of physical forces, but to the wrath of demons or wicked angels. He regarded as good examples of pagan folly the incantations and sacrifices made by the people of Cleonae, and also their drawing of blood from their fingers when an animal was not available for sacrifice.

The Alexandrian Eusebius¹⁶⁹ thought it foolish to claim that rains could be dispelled by incantations. If workers of magic could drive away clouds, why did they not do so when hail began to fall?

Pliny the Elder¹⁷⁰ knew some of the incantations against hail, but they taxed even his credulity, so that he refused to record them.

Aristophanes found in Athens an audience that could appreciate his gibes at popular superstitions concerning the weather¹⁷¹. He pretends that it is dangerous to disbelieve that clouds cause hailstorms¹⁷²:

But if any one amongst you dare to treat our claims
with scorn,
Mortal he, the Clouds immortal, better had he ne'er
been born!
He from his estates shall gather neither corn, nor
oil, nor wine,
For whenever blossoms sparkle on the olive or the
vine
They shall all at once be blighted; we will ply our
slings so true.
And if ever we behold him building up his mansions
new,
With our tight and nipping hailstones we will all his
tiles destroy.

¹⁶²See The Gentleman's Magazine 96 (1826), Part I, 419-420, where an interesting story about St. Hidulphus is told in great detail. Protracted search has not enabled me to find the original source of the story. It does not occur in the 'Lives' of St. Hidulphus in the Acta Sanctorum, 3.211-226.

¹⁶³Malleus Maleficarum 144 (see note 20, above).

¹⁶⁴See the text connected with note 155, above.

¹⁶⁵See, for example, the text connected with notes 140, 148, 150-153, above.

¹⁶⁶For examples in my previous papers see C. W. 25.216 C-D, 27.28 B-C.

¹⁶⁷Naturales Quaestiones 4.6.1-7.1. I give the translation by John Clarke, Physical Science in the Time of Nero, 181-182 (London, Macmillan, 1910). An important passage in this connection is to be found in Sir James G. Frazer, The Worship of Nature, 1.45-46 (New York, Macmillan, 1926).

¹⁶⁸Stromata 6.3.31 (Migne, P. G., 9.248).

¹⁶⁹Sermones 22.3 (Migne, P. G., 86.456). See also Pseudo-Justinus, Quaestiones et Responsiones ad Orthodoxos 31 (Migne, P. G., 6.1277).

¹⁷⁰17.267, 28.29. See note 95, above.

¹⁷¹See the Clouds, especially 1115-1130.

¹⁷²Clouds 1121-1127. The translation is by B. B. Rogers, The Comedies of Aristophanes (London, G. Bell and Sons, 1916). <Rogers's translation of all the plays of Aristophanes may now be found in The Loeb Classical Library (three volumes, all published in 1924). C. K.>.

¹⁷³Icaromenippus 25-26.

Lucian¹⁷³ too pokes fun at age-old beliefs when he represents Zeus as sorting out the weather^{173a}, and as ordering a thousand bushels of hail to be distributed over Cappadocia.

In my eyes the most interesting crusader against popular meteorology was Agobard, who wrote in the ninth century a work called *De Grandine et Tonitruis*¹⁷⁴. He observed the ways of persons in and near Lyons, where almost everyone, of high position or low, townsman or countryman, old or young, thought that hailstorms and thunder were subject to the will of man. When persons in this region heard thunder and saw lightning, they would remark, *Aura levatitia est*, but, when they were pressed for the meaning of the words *aura levatitia*, some with a little reserve and others with the confidence of ignorant men would declare that the air was *levata* by the incantations of weather-makers and hence was called *levatitia aura* (...confirmant incantationibus hominum qui dicuntur Tempestarii esse levatam, et ideo dici levatitiam auram)¹⁷⁵.

Agobard felt outraged at the claims of charlatans that they shared with God the control of the weather. They asserted that they were able not only to send storms, but also to protect the inhabitants of an area from bad weather. For their services they got a certain proportion of the crops, which was called *canonicum*. Many peasants who refused to give tithes and to help widows and orphans and other persons in need gladly paid this tribute for protection of their fields from storms¹⁷⁶.

I have given Agobard's story of the ships from *Magonia*¹⁷⁷. He pilloried believers in this tale as *dementia obruti* and *stultitia alienati*. He himself, however, found the greatest disproof of pagan ideas in the passages of the Old Testament which represent Jehovah or God as exercising control over the weather.

In a sermon delivered in 963, Ratherius of Verona, who had probably read Agobard, likewise regarded popular beliefs as wrong because they conflicted with the words of the Bible¹⁷⁸:

Intendat charitas vestra: Contra enim eos qui dicunt, quod homo malus, vel diabolus tempestatem faciat, lapides grandinum spargat, vineta atque campos devastet, fulgura mittat, iumenta et pecora, ipsosque homines interficiat; contra illos, inquam, valet quod dicit: *Ego occidam et vivere faciam*. Contra illos vero qui dicunt, quod ipsi per incantationes suas ipsas tempestates avertant, valet quod dicit: *Non est qui de manu mea possit eruere*.

In the tenth century Cassianus Bassus, who made a collection of ancient magical practices in regard to hail¹⁷⁹, considers some of them inept and advises against resorting to them¹⁸⁰. He seems to be more interested in not leaving any gaps in the records of antiquity than in saving fields from hail.

It is fitting to close this section of my paper by allowing Cicero¹⁸¹ to speak in his own tongue:

At enim minora di neglegunt neque agellos singulorum nec viticulas persequuntur, nec, si uredo aut grandio quippiam nocuit, id Iovi animadvertendum fuit: ne in regnis quidem reges omnia minima curant. . . .

MODERN REFERENCES

Publications devoted exclusively to weather lore are comparatively rare. I know of none more fascinating than a booklet by G. Bellucci, *La Grandine nell' Umbria*¹⁸². Its author made a systematic and persistent effort to learn the popular beliefs and practices in regard to hail in a limited vine-growing area of Italy, but there can be no doubt that his findings are representative of ideas prevalent in much of Southern Europe. The spirit of antiquity survives among Italian peasants, who seem, however, to use amulets a little more frequently than the ancients did. Explosives give contemporary Europeans a great advantage over the ancients in noise-making devices¹⁸³ to be used in connection with hail and storms.

Scores of references to superstitions about hail are given in *Handwörterbuch des Deutschen Aberglaubens*, under the words Hagel, Hagelzauber¹⁸⁴.

Interesting information about hail has been gathered by C. F. Talman, in *The Realm of the Air: A Book about Weather*, Chapter VII, Hail and the Damage It Does (75-82)¹⁸⁵.

(To be continued)

UNIVERSITY OF MICHIGAN

EUGENE S. MCCARTNEY

ON CERTAIN EPITAPHS, ROMAN AND AMERICAN

When Verginius Rufus died in 97 A. D., he was honored with a state funeral at which the eulogy was delivered by the consul Cornelius Tacitus, *laudator eloquentissimus*, as Pliny the Younger wrote to his friend Romanus (*Epistulae* 2. 1.6). The letter itself is a eulogy of Verginius Rufus, Pliny's old friend and guardian. Verginius left instructions for his tomb and his epitaph (6.10. 2-4). Ten years later, however, to Pliny's deep distress the tomb was still unfinished *inertia eius cui cura mandata est* (6.10.2). Pliny discovered this when he visited a villa at Alsium that then belonged to his mother-in-law Pompeia Celerina, but had once belonged to Verginius and had been a favorite retreat of his old age (6.10.1). Pliny wrote of this visit to his friend Albinus (6.10), and quoted the epitaph that Verginius had chosen (4):

Hic situs est Rufus, pulso qui Vindice quondam imperium adseruit non sibi, sed patriae.

¹⁸¹De Natura Deorum 3.86.

¹⁸²See note 1, above. For some French superstitions about hail see P. Sébillot, *Le Folk-Lore de France*, 1.109-112 (Paris, E. Guilmoto, 1904).

¹⁸³I have only one example of the ancient use of noise against hail (see the text connected with note 110, above), but noise was frequently employed against thunder and eclipses (see C. W. 25. 207 C).

¹⁸⁴Edited by Eduard Hoffman-Krayer (Berlin and Leipzig, Walter de Gruyter and Company, 1927-).

¹⁸⁵See note 39, above.

^{173a}In using the expression "sorting out the weather" I was thinking of some verses of James Whitcomb Riley, in *Wet-Weather Talk*: "It hain't no use to grumble or complain; It's just as cheap and easy to rejoice.—When God sorts out the weather and sends rain, Wy, rain's my choice". See *The Complete Works of James Whitcomb Riley*, Collected and Edited by E. H. Eitel, 3.94 (Indianapolis, The Bobbs-Merrill Company, 1913).

¹⁷⁴This work is readily accessible in Migne, P. L., 104.147-158.

¹⁷⁵1 (Migne, P. L., 104.147).

¹⁷⁶14-15 (Migne, P. L., 104.156-157).

¹⁷⁷See the text connected with note 140, above.

¹⁷⁸Sermo VIII.4, De Ascensione Domini (Migne, P. L., 136.739).

¹⁷⁹Geoponica 1.14. ¹⁸⁰Geoponica 1.14.11.



Greek and Roman Weather Lore of Two Destructive Agents, Hail and Drought (Continued): III. Drought

Author(s): Eugene S. McCartney

Reviewed work(s):

Source: *The Classical Weekly*, Vol. 28, No. 3 (Oct. 15, 1934), pp. 17-23

Published by: [Classical Association of the Atlantic States](#)

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The Classical Weekly

VOLUME XXVIII, No. 3

MONDAY, OCTOBER 15, 1934

WHOLE No. 747

GREEK AND ROMAN WEATHER LORE OF TWO DESTRUCTIVE AGENTS, HAIL AND DROUGHT

(Continued from page 12)

III. DROUGHT

GENERAL REMARKS

It is an ill wind that blows nobody good, but there are no extenuating circumstances for a drought. When it does not injure or destroy one's means of livelihood, it interferes with one's pleasure and comfort. The story of the hardships entailed by droughts is much the same in all ages. A vivid description of one protracted drought is to be found in a passage in a long sermon preached by St. Basil¹⁸⁶:

'We see, O brothers, the heavens impervious to rain, bare, and cloudless, making hateful this brightness and afflicting us with the clearness which we at first greatly desired when the long-continued cloudiness caused us dark and sunless days. The earth, now exceedingly parched, is unpleasant to look upon, being unfit for tillage and unproductive. It has opened in cracks and is receiving the gleaming rays in its depths. Springs that used to be full and ever-flowing have failed us, and the streams of great rivers have dwindled. The smallest children wade in them, and women with burdens cross them¹⁸⁷. Even drinking water has failed most of us, and we are in want of the things necessary for life'.

One of the most terrible droughts of antiquity began in Asia Minor about the middle of the fifth century A. D. It finally spread to Palestine and other areas. The inhabitants of Phrygia, Galatia, Cappadocia, and Cilicia, being in want of the bare necessities of life, had recourse to unwholesome food, which gave rise to a pestilence that brought death on the third day. When relief seemed beyond hope, Heaven rained down food in a manner which recalled to the Church historian, Evagrius, the manna that fell upon the Israelites. The next year Heaven caused the fruits of the earth to mature spontaneously¹⁸⁸.

A graphic picture of the terrors of dry weather appeared in one of our own magazines before the protracted drought of 1930¹⁸⁹:

Back on the Maine farm where I grew up the weather had two major terrors: In winter—The Blizzard! In summer—The Drought! And of the two the drought was infinitely more to be feared. In the spring we would plant crops with high hopes. Across the dark earth the blades would write their green lines of promise. The faces of the fields would lift lustily to the sun, until the heads of the herd's grass billowed in every breeze. Then, in some years, the rains would fail. Weeks, months, would pass with only an occasional shower. With the parching of the crops, which furnished much of our

winter sustenance, it seemed that our lifeblood was drying up¹⁹⁰. Farmers would gaze at the cloudless skies and shake their heads. Even our childish merriment was subdued.

One does not easily forget the menace of a Lean Year.

Drought and another destructive agent, excessive rainfall, are often mentioned in one and the same breath¹⁹¹. The farmer was always bemoaning dry weather or excessive rainfall¹⁹², evils against which it was impossible to provide protection¹⁹³. He abused 'those responsible' whenever there was too much or too little rain¹⁹⁴. Aristophanes makes the Clouds say that they will guard the crops, so that they shall not suffer from too much rain or from not enough rain¹⁹⁵. According to Theognis¹⁹⁶, Zeus failed to please whether he sent rain or withheld rain.

A vivid picture of the attitude of the English farmer toward excessive rainfall a hundred years ago is given by Thomas Hardy¹⁹⁷:

The farmer's income was ruled by the wheat-crop within his own horizon, and the wheat-crop by the weather. Thus, in person, he became a sort of flesh-barometer, with feelers always directed to the sky and wind around him. The local atmosphere was everything to him; the atmosphere of other countries a matter of indifference. The people, too, who were not farmers, saw in the god of the weather a more important personage than they do now. Indeed, the feeling of the peasantry in this matter was so intense as to be almost unrecognizable in these equable days. Their impulse was well-nigh to prostrate themselves before untimely rains and tempests, which came as the Alastor of those households whose crime it was to be poor.

PREDICTIONS AND SIGNS OF DROUGHT

Perhaps the most unusual weather seer of antiquity was Hermotimus of Clazomenae. If we may believe a recorder of miraculous events¹⁹⁸, the soul of Hermotimus departed from his body for many years and dwelt elsewhere. While it was absent, it could predict heavy rains, droughts, earthquakes, famines, and similar things.

There were, however, many simpler ways of securing similar information. When comets were frequent, people expected drought, or winds and drought together¹⁹⁹. The appearance of a comet of the kind called *hippeus*, if it looked toward the North, portended a

¹⁹⁰Aratus tells (Phaenomena 1096-1098) of the dread of the ancient farmer that the harvest might be vexed by drought and come with empty ears and chaff.

¹⁹¹See, for example, Sophocles, Fragment 524 (The Fragments of Sophocles, Edited with Additional Notes from the Papers of Sir R. C. Jebb and Dr W. G. Headlam, by A. C. Pearson, 2.167 [Cambridge: At the University Press, 1917]); Ovid, Fasti 4.641-644; Valcandi Vita S. Deodati 25 (Migne, P.L., 151.631). Gregory of Tours, Historia Francorum 9.17 (Migne, P.L., 71.495), speaks of the damage that great rainfall caused in vineyards.

¹⁹²Plato, Axiochus 368 C. ¹⁹³Xenophon, Oeconomicus 5.18.

¹⁹⁴Simplicii Commentarius in Epicteti Enchiridion 38 (31).

¹⁹⁵Clouds 1120. ¹⁹⁶25-26. ¹⁹⁷The Mayor of Casterbridge, Chapter 26.

¹⁹⁸Apollonius, Mirabilia 3.

¹⁹⁹Th., De Signis 34; Aratus 1092-1093; Aristotle, Meteorologica 1.7, 344 b.

¹⁸⁶Homilia Dicta Tempore Famis et Siccitatis 2 (Migne, P.G., 31.305). Columns 303-328 are devoted to this sermon.

¹⁸⁷Tacitus tells us (Historiae 4.26) that the lowness of the Rhine in 69 A.D., when there was barely enough water to float a boat, was regarded by the ignorant as a prodigy.

¹⁸⁸Evagrius 2.6. ¹⁸⁹Merle Crowell, The American Magazine 108.41 (December, 1929).

pestilential drought²⁰⁰. According to Aristotle²⁰¹, the air is full of wind during droughts.

A roaring sound that seemed to arise from below and ascend heavenward betokened want and famine²⁰², presumably caused by drought.

When the blazing heat of the sun continued for several days, it portended a long-continued drought or wind²⁰³.

If the kermes oak fruited well, there was going to be a severe winter, but some said that this was a sign of droughts to come²⁰⁴. The advent of a lion into a crop-producing country signified a dry spell²⁰⁵. If large numbers of birds arrived on the mainland from islands, a severe drought was expected²⁰⁶. It was explained by a scholiast²⁰⁷ that islands felt the effect of drought first and that the birds left when conditions were becoming bad.

There are signs which indicate poor seasons and inferior or worthless crops. These calamities are often due to drought. I shall, however, reserve this material for a future paper.

A few modern signs of drought may be noted. In *Five Hundred Pointes of Good Husbandrie*²⁰⁸ Thomas Tusser says of the moon:

If great she appereth, it showreth out,
If small she appereth, it signifieth drout.

There are other adages about drought:

Wind east or west
Is a sign of a blast;
Wind north or south
Is a sign of a drought²⁰⁹.

North and south, the sign o' drouth;
East and west, the sign of blast²¹⁰.

Rain from the south prevents the drought;
But rain from the west is always best²¹¹.

Fair weather for a week with a southern wind is likely to produce a great drought, if there has been much rain out of the south before²¹².

In the numerous 'brontologies' of the *Catalogus Codicum Astrologorum Graecorum*²¹³ drought and hot weather are mentioned many times. Two examples will suffice. If it thunders in April when the sun is in Aries and rain does not fall, there will be drought and failure of crops in certain parts of the world²¹⁴. If it thunders in July while the moon is in Cancer, there will not be rain until the beginning of winter²¹⁵.

THE RISING OF THE DOG-STAR A SIGN OF HOT WEATHER

Hot weather was the normal expectation while the Dog-star held sway. When it rose, the earth became parched and dry, and crops ripened prematurely²¹⁶. It brought unspeakable harm to flocks²¹⁷. Persius²¹⁸ de-

scribes it in anything but sympathetic words: *Siccas insana canicula messis iam dudum coquit et patula pecus omne sub ulmo est.*

Its blighting effects are well set forth by Valerius Flaccus²¹⁹ in an extended simile:

... E'en so, when the fierce wrath of God, and the Dog-star, fell ravager of Calabria's plains, press sore upon steading and stall and harvest-fields, the untutored yokels flock together to the hallowed grove, and the man of God teaches them how to frame their humble prayers and vows to Heaven. ...

Paraphrasing Horace²²⁰, Dryden thus pictures the hot weather caused by the Dog-star²²¹:

The sun is in the Lion mounted high;
The Syrian²²² star
Barks from afar,
And with his sultry breath infects the sky;
The ground below is parched, the heavens above us fry.
The shepherd drives his fainting flock
Beneath the covert of a rock,
And seeks refreshing rivulets nigh:
The Sylvans to their shades retire,
Those very shades and streams new shades and streams
require,
And want a cooling breeze of wind to fan the raging fire.

Thanks to the intercession of Aristaeus the inhabitants of the Cyclades secured some measure of relief from this devastating star²²³:

... But when from heaven Sirius scorched the Minoan Isles, and for long there was no respite for the inhabitants, then by the injunction of the Far-darter they summoned Aristaeus to ward off the pestilence. And by his father's command he left Phthia and made his home in Ceos, and gathered together the Parrhasian people who are of the lineage of Lycaon, and he built a great altar to Zeus Icmæus, and duly offered sacrifices upon the mountains to that star Sirius, and to Zeus son of Cronos himself. And on this account it is that Etesian winds from Zeus cool the land for forty days, and in Ceos even now the priests offer sacrifices before the rising of the Dog-star²²⁴.

DRY WEATHER AND EARTHQUAKES

Modern lore says that in dry weather all signs fail²²⁵, but among the ancients long droughts or heavy and continuous rains were supposed to precede earthquakes²²⁶. One source states that in summer drought helped to cause earthquakes²²⁷. Astrology taught that earthquakes were followed by dry spells²²⁸.

Dreadful droughts and sudden and violent earthquakes occurred at the time of the eruption of Vesuvius²²⁹. Similar catastrophes, with their warnings of evil,

²¹⁹1.682-685. I give the translation by H. G. Blomfield, *The Argonautica of Gaius Valerius Flaccus Setinus Balbus*, Book I (Oxford, B. H. Blackwell, 1916). <For a notice, by Charles Knapp, of this book see THE CLASSICAL WEEKLY 11.110-111. C.K.>.

²²⁰Odes 3.29.

²²¹To be found in *Poems Included in Sylvae* (Second Miscellany), 1685. I give the text as found in *The Works of John Dryden, Illustrated With Notes, Historical, Critical, and Explanatory, and Life of the Author by Sir Walter Scott, Revised and Corrected by George Saintsbury*, 12.365 (Edinburgh, T. and A. Constable, 1885).

²²²Should we read 'Sirian'?

²²³Apollonius Rhodius 2.516-527. I give the translation by R. C. Seaton, in *The Loeb Classical Library. The Scholium on 2.498* is important. Many other references to this event have been collected by Professor A. S. Pease, in his notes on Cicero, *De Divinatione* 1.130 (M. Tulli Ciceronis *De Divinatione*, University of Illinois Studies in Language and Literature, VI, VIII [1920, 1923]).

²²⁴For other lore of the Dog-star see C. W. 20.51 A-52 A, 23.6 A.

²²⁵One may still hear this saying, ²²⁶Pausanias 7.24.7.

²²⁷Lydus, *De Ostentis* 53. ²²⁸*Catalogus Codicum Astrologorum Graecorum*, 8, Part 3, 124, 195 (see note 87, above).

²²⁹Dio Cassius 66.22.3.

²⁰⁰Lydus, *De Ostentis* 12. ²⁰¹*Meteorologica* 2.8, 366 b.

²⁰²Julius Obsequens 46 (106). ²⁰³Th., *De Signis* 26.

²⁰⁴Th., *De Signis* 49. ²⁰⁵Aelian, *De Natura Animalium* 8.

²⁰⁶Th., *De Signis* 17; Aratus 1094-1098. ²⁰⁷On Aratus 1095, 1098.

²⁰⁸Edited by W. Payne and S. J. Herrtage, and published for the English Dialect Society: see Series D, Miscellaneous, page 30 (London, Trübner, 1878).

²⁰⁹Richard Inwards, *Weather Lore: A Collection of Proverbs, Sayings, and Rules Concerning the Weather*, 90 (London, Elliot Stock, 1898).

²¹⁰*Ibidem*. ²¹¹*Ibidem*, 131. ²¹²*Ibidem*, 97.

²¹³See note 87, above. ²¹⁴7.164. ²¹⁵7.164-165.

²¹⁶Ovid, *Fasti* 4.939-940. ²¹⁷Apollonius Rhodius 3.957-959.

²¹⁸3.5-6. Compare *damnosus canicula* in 3.49.

added to the general alarm at the outbreak of the Peloponnesian War²³⁰:

And traditions which had often been current before, but rarely verified by fact, were now no longer doubted. For there were earthquakes unparalleled in their extent and fury, and eclipses of the sun more numerous than are recorded to have happened in any former age; there were also in some places great droughts causing famine, and lastly the plague which did immense harm and destroyed numbers of the people.

DROUGHTS CAUSED BY BLOODSHED

Nothing else brought droughts more surely than murder, and nothing else caused longer and more severe droughts. There is a striking example in the legendary history of Attica²³¹. By order of Aegeus some countrymen waylaid and assassinated Androgeus, the son of Minos, near Oenoe in Attica. Minos demanded justice, which was refused, whereupon he proclaimed war upon the Athenians and besought Zeus to send a drought and famine upon their city. Immediately a great drought occurred in Attica, and even throughout all Greece. Amid the great suffering and famine that followed, the chief men of several cities had the god at Delphi consulted in order to learn what they should do to get rid of the affliction. They were directed to have Aeacus, the son of Zeus, and of Aegina, the daughter of Asopus, offer sacrifices in their behalf. When these instructions had been carried out, the drought and the famine ceased everywhere but in Attica, so that the Athenians again resorted to the oracle.

The god told them that to expiate the murder of Androgeus they should comply with whatever demands Minos might make. He bade them send every year for seven years seven boys and seven girls as offerings to the Minotaur²³².

Aeacus was called upon to intercede for Greece during another (?) drought²³³ caused by a murder. He was picked out by the leaders both because of his relationship to Zeus and because of his piety²³⁴.

Now Aeacus was the most pious of men. Therefore, when Greece suffered from infertility on account of Pelops, because in a war with Stymphalus, king of the Arcadians, being unable to conquer Arcadia, he slew the king under a pretence of friendship, and scattered his mangled limbs, oracles of the gods declared that Greece would be rid of its present calamities if Aeacus would offer prayers on its behalf. So Aeacus did offer prayers, and Greece was delivered from the dearth²³⁵.

As soon as Aeacus had ascended a mountain and stretched forth his hands in prayer, there was an auspicious peal of thunder and clouds began to gather.

²³⁰Thucydides 1.23.3. I give the translation by Benjamin Jowett (Oxford: At the Clarendon Press, 1900).

²³¹Diodorus 4.60.5-61.3. Compare Plutarch, Theseus 15.1; Apollodorus 3.15.8 (see note 233, below).

²³²For a drought caused by Neptune on account of the failure of Melissus to get justice from Corinth for the killing of Actaeon see Plutarch, Moralia 772 B-773 B.

²³³Sir James George Frazer, Apollodorus, The Library, 2.56 (London, Heinemann, 1921), seems to regard the following account and the story of Minos as discrepant explanations of the same drought. <For a review, by Charles Knapp, of this work, which is part of The Loeb Classical Library, see THE CLASSICAL WEEKLY 15.197-198, C.K.>

²³⁴Isocrates, Evagoras 14.

²³⁵Apollodorus 3.12.6 (see note 233, above). See also Pausanias 1.44.9, 2.29.7-8; Isocrates, Evagoras 14-15; Clement of Alexandria, Stromata 6.3.28 (Migne, P.G., 9.246); Scholiast on Pindar, Nemea 5.17; Eudocia, Violarium 13. The scholiast on Aristophanes, Equites 1253, speaks of a drought in Aegina.

Abundant rain fell and restored fertility²³⁶. In gratitude Aeacus built a sanctuary on Mount Panhellenius²³⁷.

In Egypt the land yielded its increase by the aid of the waters of the Nile, but the waters did not always save the country from want and famine. The seven lean years described in the Bible were exceeded by the nine years of dearth in the time of King Busiris. After the land had suffered for this long period, there came to Busiris from Cyprus a soothsayer named Thrasius, who explained that Jupiter could be appeased by the blood of a stranger. Thereupon the king made Thrasius the first victim²³⁸. The story is thus told by Ovid²³⁹:

Dicitur Aegyptos caruisse iuvantibus arva
imbribus atque annos sicca fuisse novem²⁴⁰,
cum Thrasius Busirin adit monstratque piari
hospitis adfuso sanguine posse Iovem.
Illi Busiris, "Fies Iovis hostia primus",
inquit, "et Aegypto tu dabis hospes aquam".

When Heracles reached Egypt in his wanderings, he was seized and brought to the altar to serve as the annual victim, but he broke his bonds and slew the king²⁴¹.

In historical times the story of Busiris proved a source of embarrassment to Greeks and Egyptians. Herodotus²⁴² discredited it and thought that by so doing he was winning the favor of gods and heroes. Isocrates²⁴³ got rid of the difficulty by explaining that Heracles and Busiris were not contemporaries. It is also stated that there never was a king named Busiris, and that the invention of the story was due to a desire to malign the inhabitants of the Busirite Nome as inhospitable, a falsehood for which the Egyptians in general had to suffer an evil reputation²⁴⁴.

SENDERS OF DROUGHT

Although Polybius²⁴⁵ tried to see relations of cause and effect in the natural world, he nevertheless believed that things whose causes it was difficult or impossible to ascertain should be ascribed to god or to fortune. As examples he gives droughts and frosts.

As we shall see, both pagan deities and the Christian God sent drought in dealing with erring mankind²⁴⁶. The power of causing a dry spell was attributed, however, to an occasional wise man and to many weather magicians. Empedocles could induce a drought after rain, as well as a tree-nourishing rain after drought²⁴⁷. There were also mountain-dwelling Brahmins who by prayer could occasion either rainy or rainless weather²⁴⁸.

²³⁶Clement of Alexandria, Stromata 6.3.28 (Migne, P.G., 9.246).

²³⁷Pausanias 2.30.4. For interesting material on Mount Panhellenius, which was a local weather index, see A. B. Cook, Zeus, 2.984, note 3 (Cambridge: At the University Press, 1925).

²³⁸Apollodorus 2.5.11 (see note 233, above).

²³⁹Ars Amatoria 1.647-652.

²⁴⁰The period is sometimes given as eight years for instance by Daniel-Servius on Vergil, Georgics 3.5.

²⁴¹For other references to the story of Busiris, which has many ramifications, see Isocrates, Busiris 36-37; Plutarch, Moralia 315 B-C; Diodorus Siculus 4.18.1, 4.27.3; Scholium on Apollonius Rhodius 4.1396; Ovid, Metamorphoses 9.182-183, Ibis 397-400, and Scholia on 397; Daniel-Servius on Vergil, Aeneid 8.299; Vergil, Georgics 3.5, and Daniel-Servius on the passage; Aulus Gellius 2.6.3; Hyginus, Fabulae 31, 56; Macrobius, Saturnalia 6.7.5; Lactantius Placidus on Statius, Thebais 12.155; Claudian, In Eutropium 1.150-162; Evagrius, Busiris 36-37.

²⁴²2.45. ²⁴³Busiris, 36-37. ²⁴⁴Strabo 17.19.

²⁴⁵7.9. ²⁴⁶See the text connected with notes 254-264, below. ²⁴⁷Empedocles, Fragment 111, in H. Diels, Die Fragmente der Vorsokratiker, I, 263 (Berlin, Weidmann, 1912).

²⁴⁸Damascius, Vita Isidori 67.

Origen tells us²⁴⁹ that there were demons who caused pestilences, barrenness of the soil, and storms. Many thought that such calamities as famine, scarcity, earthquakes, and droughts are to be ascribed to maleficent demons²⁵⁰. In the sixth century even members of the Christian clergy held that drought and similar calamities were sent by the devil, for in 563 a synod which met at Braga in the Spanish province of Galicia ruled that such persons were to be anathema²⁵¹.

A scholiast²⁵² informs us of persons who made sacrifices called 'purifications' in order to ward off drought, famine, and similar things, but these persons were regarded as worthless and as plotting against nature. Seneca²⁵³ regarded as nonsense the idea that rain could be either repelled or induced by incantation.

DROUGHT AS A PUNISHMENT

The activity of the elements was attributed to divine agency; so was their inactivity—drought. As a rule, dry weather was regarded as a visitation from Zeus by way of punishment, but it was sometimes ascribed to the displeasure of the gods in general.

We are told that drought came whenever justice had fallen into disrepute and was disowned by men²⁵⁴. Even in Petronius²⁵⁵ it is said that such a calamity was inflicted because men were no longer devout.

In view of such ideas it can be seen that a dry period was a signal for retrospection and action. Christian leaders sometimes exhorted the people to show repentance for the sins which caused the trouble.

With these ideas one may compare Leviticus 26.3-4:

If ye walk in my statutes, and keep my commandments, and do them;

Then I will give you rain in due season, and the land shall yield her increase, and the trees of the field shall yield their fruit.

Whenever a drought occurs in a period of waning religious fervor, there are always some minds which see a relation of cause and effect. An example occurs in Amos 4.7²⁵⁶:

And also I have withholden the rain from you, when there were yet three months to the harvest: and I caused it to rain upon one city, and caused it not to rain upon another city: one piece was rained upon, and the piece whereupon it rained not withered.

In 429 B. C. Italy was much afflicted by lack of rain, so that streams were almost dry. Flocks were dying, and diseases were wasting both man and beast. When the leaders of the State investigated, they became alarmed at the inroads which foreign religious rites and superstitions were making. They instructed the aediles to see that none but Roman gods should be worshiped and that ceremonies should be conducted only in the manner of the fathers²⁵⁷.

Centuries later, in the time of Tertullian, when the Tiber overflowed, or the Nile failed to cover the fields beside it, or the heavens withheld rain, or some other

affliction came, a new religion was again blamed and there arose the cry *Christianos ad leonem*²⁵⁸. Cyprian²⁵⁹ felt outraged whenever excessive rain or drought was charged to the Christians.

In a very long sermon by St. Basil, from which a quotation has been made²⁶⁰, we find the occurrence of a dry spell an occasion for calling men to repentance, much in the manner of an Old Testament prophet²⁶¹. St. Basil indicts the men for not being busy at work, and the women for being their ministers in quest of Mammon²⁶². When a Church service is over, the few that attend, most of them sick persons, depart, he says, as from a prison, glad to have done with the need of prayer. Even the smallest children, leaving their tablets and books in School, are making a holiday of the emergency and are rejoicing over their escape from the short hours with the master. A multitude of care-free men involved in sin and carrying in their minds the cause of evil has brought the calamity.

The affliction is sent, continues St. Basil, because men are turning from the ways of God. It is God's wish not to destroy men, but to correct and chastise them like wayward children.

In similar manner Cyprian holds that scanty rainfall and destructive hailstorms are due to the displeasure of the Deity²⁶³.

One of the record-breaking droughts of Greek history (or legend) was caused by the disobedience of Grinus, king of the island of Thera. When he was making offerings at Delphi, he was told to found a colony in Libya. Because of his age he was reluctant to do so, and he even failed to have someone else fulfill the oracle. For seven years after that no rain fell on the island, and all the trees withered, except one. On consulting the oracle again—somewhat belatedly, it would seem—the Theraeans were reminded of the oracle about the colony and immediately took measures to carry out its directions²⁶⁴.

PROPITIATION OF THE DIVINE POWERS

Amid the blighting effects of drought men inevitably turn to the gods. Under such circumstances the Greeks and the Romans prayed, held sacrifices, and conducted processions.

An Athenian prayer has been preserved for us by Marcus Aurelius²⁶⁵, who was charmed by its simple beauty: 'Rain, rain, dear Zeus, upon the plowed fields of the Athenians and on the plains'. Since the rain fertilized the earth²⁶⁶, participants in the Eleusinian mysteries, looking up to heaven, shouted, 'Rain', and then, looking down to earth, cried 'Conceive'²⁶⁷.

²⁴⁹Tertullian, *Apologeticus* 40.

²⁵⁰*Ad Demetrianum* 2 (Migne, P. L., 4.564).

²⁵¹See note 186, above, and the text to which that note applies. The additional material used here is from Migne, P. G., 31.308-309.

²⁵²Compare Gregory, *Historia Francorum* 10.30 (Migne, P. L., 71.562).

²⁵³I Samuel 12.17-18; II Chronicles 6.26-28.

²⁵⁴Compare Frazer, *The Magic Art*, 110-114, for the belief of savages that incest may cause drought.

²⁵⁵Cyprian, *Ad Demetrianum* 7 (Migne, P. L., 4.568). See also Valcandi Vita S. Deodati 25 (Migne, P. L., 151.631).

²⁵⁶Herodotus 4.150-151.

²⁵⁷*Ad Se Ipsum* 5.7. See Morgan, 92.

²⁵⁸Compare Aeschylus, Fragment 44 *δμῆρος... ἔκυσε γαίαν*. A Nauck, *Tragicorum Graecorum Fragmenta*, page 16 (Leipzig, Teubner, 1889), prints *ἔδευσεν* in the text, but records the reading *ἔκυσε* from several manuscripts.

²⁵⁹Proculus on Plato, *Timaeus* 293 C.

²⁴⁹Contra Celsum 1.31 (Migne, P. G., 11.717, 719).

²⁵⁰Porphyrius, *De Abstinencia* 2.40.

²⁵¹See note 161, above. ²⁵²On Aristophanes, *Ranae* 730.

²⁵³*Naturales Quaestiones* 4.7.2.

²⁵⁴Philostratus, *Life of Apollonius of Tyana* 3.34. ²⁵⁵44.

²⁵⁶See also Deuteronomy 11.17; I Kings 17.1, 18.1, 41-45; II Kings 3.17; II Chronicles 6.26-28; Jeremiah 14.4, 17.8; Haggai 1.11.

²⁵⁷Livy 4.30.7-11.

The Parthenon contained an image of Earth praying for rain, either because the Athenians themselves needed rain, or because the drought was over all Greece²⁶⁸. A few words from a Roman *Precatio Terrae*²⁶⁹ may be noted here:

Dea sancta Tellus, rerum natura parens,
tu Ditis umbras tegis et immensum chaos
ventosque et imbres tempestatesque attines
et, cum libet, dimittis. . . .

After Rhea had brought forth Zeus in Arcadia, she sought in vain for water in the thirsty Metope River. Thereupon she told Earth also to bring forth. Earth smote a mountain with her staff; the mountain parted and poured forth a mighty flood²⁷⁰.

In China, too, the Earth God is associated with the weather²⁷¹:

. . . In spite of the dark red dawn the sun was mounting the horizon clouds and sparkled upon the dew on the rising wheat and barley. The farmer in Wang Lung was diverted for an instant and he stooped to examine the budding heads. They were empty as yet and waiting for the rain. He smelled the air and looked anxiously at the sky. Rain was there, dark in the clouds, heavy upon the wind. He would buy a stick of incense and place it in the little temple to the Earth God. On a day like this he would do it.

The year 181 B. C. was noteworthy for dryness and dearth of crops in Italy. The absence of rain for six months caused the Romans to consult the Sibylline Books and to make a *supplicatio*²⁷².

Horace²⁷³ tells us that prayers in verse form were pleasant to the gods. He makes special mention of those for water from heaven. Doubtless there were early Christian chants for rain. A very long hymn, attributed to St. Ambrose, is still extant²⁷⁴. It would seem that there could not have been many occasions when earth and vegetation were parched enough to make it appropriate. As in the exhortations of the Old Testament prophets and in modern rogations for rain, in this hymn, too, the dryness is regarded as a punishment for sins.

HYMNUS IN POSTULATIONE PLUVIAE

Squalent arva soli pulvere multo,
Pallet siccus ager, terra fatiscit;
Nullus ruris honos, nulla venustas
Quando nulla viret gratia florum.

Tellus dura sitit, nescia roris;
Pons jam nescit aquas, flumina cursus;
Herbam nescit humus, nescit aratrum,
Magno rupta patet turpis hiatu.

Fervens sole dies, igneus ardor
Ipsas urit aves, frondea rami
Fessis tecta negant, pulvis arenae
Sicco dispuitur ore vianis.

²⁶⁸Pausanias 1.24.3. Compare Pausanias 10.12.10. See also Morgan, 91-94, 96-97.

²⁶⁹A. Baehrens, *Poetae Latini Minores*, volume one, page 139, verses 7-9 (Leipzig, Teubner, 1879).

²⁷⁰Callimachus, *Hymns* 1.10-32.

²⁷¹Pearl S. Buck, *The Good Earth*, 10 (New York, The John Day Co., 1931).

²⁷²Livy 40.29.2; Julius Obsequens 6 (60).

²⁷³Epistulae 2.1.134-138. The passage is quoted in the text, a line or two below the marking for note 291.

²⁷⁴Hymni S. Ambrosii Attributi 4 (Migne, P. L., 17.1175). <The text is given exactly as it appears in Migne, C. K.>. I have not been able to find an English translation of this hymn. The hymn for rain is preceded by one called Hymnus ad Serenitatem Poscendam.

Ventis ore^{274a} ferae, bestia ventis,
Captantesque viri flamina ventis,
Ventis et volucres ora recludunt,
Hac mulcere sitim fraude volentes.

Foetus cerva suos, pignora cerva,
Foetus cerva siti fessa recusat,
Foetus cerva pios moesta relinquit
Quaesitam quoniam non vehit herbam.

Venerunt juvenes, pocula noti
Quaerentes putei, lymphaque fugit;
Et vasis vacuis tecta revisunt,
Fletus, heu! proprios ore bibentes.

Bos praesepe suum linquit inane;
Pratorumque volens carpere gramen,
Nudam versat humum; sic pecus omne
Fraudatum moriens, labitur herbis.

Radices nemorum rustica plebes
Explorat misero curva labore,
Solarique famem cortice quaerit
Nec succos teneros arida praestat.

Hanc peccata famem nostra merentur,
Sed merce propria Christe faveto
Quo culpa gravior gratia major
Iusti supplicii vincla resolvat.

Jam coelos reseres, arvaeque laxes
Fecundo placidus imbre rogamus.
Heliae meritis impia saecula
Donasti pluvia: nos quoque dones.

Aeterne genitor, gloria Christo
Semper cum genito sit tibi sancto
Compar Spiritui, qui Deus unus
Pollens perpetuis inclyte saeculis.

Gregory of Tours²⁷⁵ tells of a drought about Arvernium in the time of Saint Quintianus. It was so severe that the parched fields and the vegetation could not provide food for cattle. In their distress the people hastened to meet the saint as he was coming to the city to conduct some religious services. Confident that God would hearken because of the man's holiness, they requested him to begin an antiphony. At once he prostrated himself and prayed with tears in his eyes. Rising, he conducted the antiphony which the people sought. He entreated God in the words of Solomon:

When the heaven is shut up, and there is no rain, because they have sinned against thee; yet. . . if they confess thy name, and turn from their sin, when thou dost afflict them;

Then hear thou from heaven, and forgive the sin of thy servants. . . ; and send rain upon thy land, which thou hast given unto thy people for an inheritance²⁷⁶.

When the people began to sing psalms fervently, the words of the confessor reached the ears of the power on high, and, behold, the heavens were darkened and shut off from view by clouds. Before the people reached the gates of the city, a drenching rain fell upon the entire land, so that all marveled and said that the rain was vouchsafed in response to the words of the blessed man.

The crude ideas of the ancients have not been refined

<^{274a}One would expect *ora*, not *ore* (the reading of Migne). C. K.>.

²⁷⁵Vitae Patrum 4.4 (Migne, P. L., 71.1025-1026).

²⁷⁶II Chronicles 6.26-27. The marks of ellipsis in the quotation in the text indicate omissions made by Saint Quintianus.

among European peasantry by the flight of time, as we may see by a quotation taken from a book of travel²⁷⁷:

...The guard...told us that he had been stationed once on the coast a little east of Girgenti, near a town where the peasants pray for rain to their patron, S. Calogero, whose painted image, carved in wood, stands in their church. If it rains at once, well and good, they return thanks, and there is an end of the matter. But if their prayers are unanswered after what they consider a reasonable time, they hold a service and punctuate their prayers with threatening cries—

"Corda, o pioggia!"

The saint sometimes chooses the second alternative and sends the rain—the peasants return thanks, and all goes well. But if he is still obdurate, they assume he has chosen the first, put the threat into execution, take down S. Calogero, tie a cord about his neck and reverently cast him into the sea where they leave him till it does rain. If one waits long enough the rain always comes at last, even on the south coast of Sicily. Then they pull the poor saint out of the water, dry him, give him a fresh coat of paint and carry him back to his place in the church, with a brass band and thanksgiving—another form of the recurrent death and resurrection of the god, imitating sunset and sunrise.

An Englishman²⁷⁸ who traveled in the Cyclades a half-century ago relates that in times of drought ikons from a convent were carried up Mount Elias on the island of Amorgos to the small chapel of the prophet Elias upon its top. Peasants followed in crowds to kneel and pray before the shrine.

It is strange how closely the prophet Elias of the Christian Greek ritual corresponds to Apollo, the sun god of old; the name <sic!> Elias and Helios doubtless suggested the idea. When it thunders they say Prophet Elias is driving in his chariot in pursuit of dragons; he can send rain when he likes, like *δυσπριος Ζεὺς* <sic!> of ancient mythology; and his temples, like those of Phoebus Apollo, are invariably set on high, and visited with great reverence in time of drought or deluge.

The idea that saints and prophets, alive or dead, are able to bring rain has not been confined to the Old World, if we may take at its face value a novelist's paragraph about Indians in New Mexico²⁷⁹:

"At Ácoma...you can see something very holy. They have there a portrait of St. Joseph, sent them by one of the Kings of Spain, long ago, and it has worked many miracles. If the season is dry, the Ácoma people take the picture down to their farms at Acomita, and it never fails to produce rain. They have rain when none falls in all the country, and they have crops when the Laguna Indians have none."

A little farther on in the same novel²⁸⁰ the magical powers of this picture are described more vividly:

...There was no doubt that the holy picture of St. Joseph had come to them from the King of Spain by the request of this Padre, and that picture had been more effective in averting drouth than all the native rain-makers had been. Properly entreated and honoured the painting had never failed to produce rain. Ácoma had not lost its crops since Friar Baltazar first brought the picture to them, though at Laguna and Zuni there had been drouths that compelled the people to live upon their famine store,—an alarming extremity.

²⁷⁷H. F. Jones, *Diversions in Sicily*, 201–202 (London, Alston Rivers, 1909). Compare the treatment of St. Angelo at Licata, as described in Frazer, *The Magic Art*, 1,300.

²⁷⁸J. Th. Bent, *The Cyclades, or Life Among the Insular Greeks*, 478 (London, Longmans, 1885).

²⁷⁹Willa Cather, *Death Comes for the Archbishop*, 87 (New York, The Modern Library, B. A. Cerf and D. S. Klopfer, 1931).

²⁸⁰109.

Daily weather reports have not destroyed the deep-seated confidence in the efficacy of prayer in times of dry weather. The Anglican Prayer Book still includes a prayer for rain. The following invocation is taken from The Book of Common Prayer, The Protestant Episcopal Church, for 1929²⁸¹:

O God, heavenly Father, who by thy Son Jesus Christ hast promised to all those who seek thy kingdom, and the righteousness thereof, all things necessary to their bodily sustenance; Send us, we beseech thee, in this our necessity, such moderate rain and showers, that we may receive the fruits of the earth to our comfort, and to thy honour; through Jesus Christ our Lord. *Amen*.

In Phillips Russell's book called Emerson, The Wisest American²⁸², there occurs a passage about Emerson's grandfather:

In dry times it was the custom for all ministers to pray for rain; and during an exceptionally severe drought Dr. Ripley said to a younger colleague with professional dignity: "This is no time for you young Cambridge men; the affair, sir, is getting serious. I will pray myself."

Perhaps antiquity had no exact counterpart to the prayer of the circuit rider in The Little Shepherd of Kingdom Come²⁸³, by John Fox:

O Lord, we do not presume to dictate to Thee, but we need rain, an' need it mighty bad. We do not presume to dictate, but, if it please Thee, send us, not a gentle sizzle-sozzle, but a sod-soaker, O Lord, a gully-washer. Give us a tide, O Lord.

I suspect that this quotation is fairly true to life. At all events the attitude is not much more naïve than that shown by persons of greater education. The following clipping, from The Ann Arbor Times News, September 4, 1925, is representative of a number in my collection:

Prayer for rain was invoked in two southern states as a means of relief from suffering caused by one of the most dangerous droughts in this section of the country in half a century.

At Columbia, S. C., Gov. McLeod issued a proclamation setting aside Sunday as a day of fasting and prayer for rain.

Another clipping, from The Detroit Free Press, September 14, 1925, records the coming of relief after a protracted drought over a wide area in the South in 1925:

Atlanta, Ga., Sept. 13.—(By the Associated Press.)—A break in the drought which has held most of the south with a firm grip many weeks, causing heavy damage to crops and a curtailment in manufacturing, came today.

In many sections people gathered in houses of worship prayed for relief, and in some instances rain fell immediately after the services.

The governors of Georgia, Alabama, North Carolina and Virginia had issued proclamations calling upon the people to pray for rain, but the prayers were not confined to these states.

Heavy rain began falling in Atlanta early in the afternoon. In some sections of the city persons who only a few minutes before had knelt in solemn prayer for relief were drenched as they left the churches.

Such isolated examples do not prove much, but the great drought of 1930 showed how quickly meteorological weather may again become theological. Days were

²⁸¹See page 40. The same page contains an invocation for fair weather. With the exception of two or three very minor changes this form of prayer has come down to us from the middle of the sixteenth century.

²⁸²See page 171 (New York, Brentano's, 1929).

²⁸³Chapter 4.

set aside for state-wide prayers, and in one instance at least fasting in addition was recommended by a governor in a proclamation. There would have been more services of this character if governors had yielded to all requests made for them.

Over a millennium ago Agobard observed²⁸⁴ that in times of drought many servants of God had interceded with Him by prayer and that He had deigned to listen to them. Churchmen have never ceased to make such appeals. The last time they did so in our own country was during the last drought.

(To be concluded)

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ELM LEAVES FOR FODDER

A news item from Paris, Missouri, under date of June 9, 1934, read, in part, as follows:

His pastures ruined by the drought and unable to buy hay, Perl Styles, a farmer northeast of here, is cutting down elm trees and feeding them to his cattle.

The cattle, Styles says, seem to enjoy the young twigs and leaves.

This announcement of a method of feeding enforced by the unusual drought of 1934 recalls the Roman practice of using elm leaves for fodder. Cato, in his *De Agri Cultura*¹, mentions this more than once. He says (6.3): "...Circum coronas et circum vias ulmos serito et partim populos, uti frondem ovibus et bubus habeas, et materies, siquo opus sit, parata erit. This is translated by Mr. Fairfax Harrison, in his *Roman Farm Management*², as follows (30): "...Plant elm trees along the roads and fence rows, so that you may have the leaves to feed the sheep and cattle, and the timber will be available if you need it..." Cato had said (5.8): "...frondem populneam, ulmeam, querneam caedito per tempus: eam condito non peraridam, pabulum ovibus..." In Chapters 30 and 54 he refers again to using leaves as fodder. Mr. Harrison, page 44, note 2, says, "The extravagant American farmer has not yet learned to feed the leaves of trees, but in older and more economical civilizations the practice is still observed".

Varro, in his work on farming³, says of the elm, in his discussion of fences (1.15): "...Serunt alii circum pinos ...alii ulmos, ut multi habent in Crustumino: ubi id pote, ut ibi, quod est campus, nulla potior serenda, quod maxime fructuosa, quod et sustinet saepe ac cogit aliquot corbularum uvarum et frondem iucundissimam ministrat ovibus ac bubus ac virgas praebet saepibus et foco ac furno.

²⁸⁴De Grandine et Tonitruis 9 (Migne, P. L., 104.153).

¹The text of Cato, *De Agri Cultura* has been edited by George Goetz (Leipzig, Teubner, 1922). This book was a revision of an edition of the text by Heinrich Keil.

²Roman Farm Management: The Treatises of Cato and Varro Done into English, With Notes of Modern Instances by a Virginia Farmer (New York, Macmillan, 1913). The "Virginia Farmer" was Mr. Fairfax Harrison, President of the Southern Railway. <Mr. Harrison had a very interesting and instructive paper, entitled The Crooked Plow, in The Classical Journal 11(1916), 323-332. In this he examines the "plowing practice" of the ancient Romans. He discusses at length the plow used by the Romans, and their method of plowing. In doing this he considers Vergil, Georgics 1.169-175, and gives a translation of a long passage in Columella, Res Rustica, Book 2 (see pages 315, 329-331). He concludes (332) that "with a less perfect implement than that we now have the Romans plowed well and probably plowed better than many of us do to-day..." C. K.>

³The text of Varro's *Rerum Rusticarum Libri III* has been edited by George Goetz (Leipzig, Teubner, 1912).

This Mr. Harrison translates as follows (102-103):

...Others plant elms, as many have done in the district of Crustumeria: indeed, for planting in plains where it flourishes there is no tree which can be set out with such satisfaction or with more profit than the elm, for it supports the vine and so fills many a basket with grapes, yields its leaves to be a most agreeable forage for flocks and herds, and supplies rails for fences and wood for hearth and oven⁴.

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ANOTHER CATULLUS TO ANOTHER LESBIA

On a shelf in Sala III of the Museo Nazionale delle Terme at Rome the eye of the visitor may light upon a small, gracefully shaped funeral urn about twelve inches in height, equipped with handle and cover. If he happens to have his Catullus well in mind at the time, he may, not unnaturally, feel a surge of startled emotion rise within him as he reads the clear-cut inscription on the rectangular *titulus* of the vase:

D M
LESBIAE · SUAE ·
QUAM · UNICE · AMA
VIT · Q · CATULLUS · ME
RENS · POSUIT · VIX ·
AN · XVII · OBIT · Q ·
CALENDAS · IULII ·

This may be rendered as follows: 'To the departed spirit of his dear Lesbia, whom he loved with single-hearted devotion, Quintus Catullus Merens has set up this memorial. Her age was seventeen years. She passed away on the fifth day before the Kalends of July'.

Who this young Lesbia and this Catullus were there is no way of ascertaining. The brief story of the urn is that of a love which was mingled at the end with bitterness and the sorrow of death. As we read it, we are reminded of the love of a better known Catullus for an older, and a less worthy, Lesbia, and of a far different kind of bitterness that was its tragic sequel.

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⁴<Cato's *De Agri Cultura* has been translated by Mr. Ernest Brehaut, in a volume entitled Cato the Censor on Farming (Columbia University Press, 1933). There are many notes in this volume. Nothing, however, is said in the notes on 5.8, 6.3, about the feeding of leaves to cattle. I call attention also to a work entitled Varro on Farming: M. Terenti Varronis Rerum Rusticarum Libri Tres, Translated, With Introduction, Commentary and Excursuses, by Lloyd Storr-Best (London, Bell, 1912: Bohn Classical Library). On page 46, note 1 Mr. Storr-Best defends the manuscript reading *sustinet saepem*, against Keil's reading, *sustinet saepe*, which was accepted by Goetz. In the text of Keil and Goetz, given in the body of this article by Professor Johnston, *saepe* is, of course, the adverb; in that text *sustinet* and *cogit* both govern *corbularum*. This struck me as awkward, even before I saw Mr. Storr-Best's note. In his text, Mr. Storr-Best renders by "often supports and collects for you many a basket of grapes..." that is he translates the Keil-Goetz text. In his note, however, he says that *sustinet saepem* would mean "supports a fence..." In this, he continues, "Schneider and the rest see no sense. But the elms might play the part of the *pali statuti crebri* mentioned in the preceding chapter (xv). A row of trees 'supporting a fence' is common enough in this country". The reference to "(xv)" should be corrected to '(xiv)'. There we read that a hedge (*saepe*) fit "...palis statutis crebris et virgultis implicatis..." This Mr. Storr-Best renders by "<The fence> is made of stakes set close together and interwoven with brushwood..." This explanation seems to me sensible, and the text defended thus by Mr. Storr-Best seems to me sound.

In 1889, on a farm in Vermont, I helped the hired man, one morning, cut down a number of small trees (beeches, I think). The cattle in the field where we were working rushed forward, when the first tree fell, and devoured the leaves. It was difficult to keep them from getting in the way of falling trees, so keen were they to eat the leaves, green, of course. C. K.>



Greek and Roman Weather Lore of Two Destructive Agents, Hail and Drought (Concluded)

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Reviewed work(s):

Source: *The Classical Weekly*, Vol. 28, No. 4 (Oct. 22, 1934), pp. 25-31

Published by: [Classical Association of the Atlantic States](#)

Stable URL: <http://www.jstor.org/stable/4339435>

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The Classical Weekly

VOLUME XXVIII, No. 4

MONDAY, OCTOBER 22, 1934

WHOLE No. 748

GREEK AND ROMAN WEATHER LORE OF TWO DESTRUCTIVE AGENTS, HAIL AND DROUGHT

(Concluded from page 23)

DID GREEKS AND ROMANS EVER BECOME TOO
SCIENTIFIC TO PRAY FOR RAIN?

Prayer has always been so obvious a means of seeking relief from drought that it would be strange if peoples ever failed to resort to it, but the following conclusions were reached by Professor M. H. Morgan²⁸⁵:

From these summaries it seems obvious that rain-prayers and rain-charms were (to use no stronger term) unusual in the best period of Greek and Roman culture, that is to say, in the fifth and early part of the fourth centuries B.C. in Greece, and during the fifty years which lie on each side of the beginning of the Christian era in the history of Rome. We ought not to be surprised at reaching this conclusion, for these were periods in which early beliefs and primitive explanations of natural phenomena found little favor. . . .

In Pausanias there are records of a number of places where religious services were conducted in order to secure rain. Professor Morgan notes²⁸⁶ that such passages are "accompanied by no statement that worship was actually going on at these places at the time of writing".

Professor Morgan²⁸⁷ collected from early authors examples of the expression 'Zeus rains', and noted that no author, from Homer to Theophrastus, says anything about prayers to Zeus for rain. He held that no passage in which Iuppiter Pluvius is named can be used to prove that the Romans ever prayed to this god for rain²⁸⁸. I might add that the words *aquae Iovis* in Horace, *Carmen Saeculare* 31, are a literary commonplace²⁸⁹. I am quite willing to believe, however, that the following verses from Horace²⁹⁰ described ceremonies, perhaps those of the *Ambarvalia*²⁹¹, which he himself had seen and which might be considered commonplace:

Poscit opem chorus et praesentia numina sentit,
caelestis implorat aquas docta prece blandis,
avertit morbos, metuenda pericula pellit,
impetrat et pacem et locupletem frugibus annum.
Carmine di superi placantur, carmine Manes.

In apparent agreement with Professor Morgan's conclusions is Seneca's implied contrast²⁹² between the

knowledge of his own times and that of 'untutored' (*rudis*) antiquity, which believed that rain could be attracted or repelled by incantations.

Yet, whatever the literary records may show or fail to show, it seems to me foreign to reason to suppose that there were centuries or parts of centuries when Greeks and Italians seldom prayed for rain^{292a} or seldom resorted to magic in order to induce rain. I suspect that the only periods in European history when prayers and other religious services for rain have been infrequent have been periods when rain has not failed. Among peasants and other illiterate persons old habits were (and are) too ingrained to permit a lacuna in the exercise of them.

Lucretius²⁹³ tries to destroy belief in divine control of the weather by asserting that the captain's prayers during storms do not cause any cessation of their fury, but he was trying to uproot a firmly fixed idea, namely that prayer has some effect in changing the weather²⁹⁴.

Ovid²⁹⁵ advises the lover whose affection is unrequited to go far away. He is to compel his unwilling feet to run and is not to pray for rain. If in Ovid's day nobody prayed for rain, there would not be much point to the injunction.

On being told by Socrates that there was no Zeus, Strepsiades protested, 'But who rains?'²⁹⁶ If the Greeks and the Romans of certain periods did not pray to Zeus for rain, we might ask, in the manner of Strepsiades, 'To whom did they pray?'

If the number of recorded examples of prayers for rain varies for certain periods of antiquity, I believe that this indicates the widening knowledge of those in control of the literary output rather than any raising of the general level of intelligence. Polybius²⁹⁷ sought for natural explanations of things, yet he attributed to the gods drought and frost and other manifestations of nature. He does not come within the dates specified by Professor Morgan, but I should not wish the task of finding any period of antiquity when the masses of the people had more meteorological knowledge than he possessed and were less superstitious about the weather than he was. The astronomer Manilius²⁹⁸ thinks that knowledge (*ratio*) has taken the thunderbolt from the

²⁸⁵108 (see note 1, above).

²⁸⁶*Ibidem*, 107. ²⁸⁷83-84 (see note 1, above).

²⁸⁸98-100 (see note 1, above).

²⁸⁹Horace is doubtless translating Διὸς θυμῶς, Homer, *Iliad* 5.91.

From this expression to Zeus' Ὀυμπῶς there is but a short step. Perhaps only metrical convenience kept Homer from using the latter expression. It seems to me strange that the first extant example of the Latin equivalent is as late as Tibullus 1.7.26. See K. F. Smith on this passage, in *The Elegies of Albius Tibullus*, 330-331 (New York, American Book Co., 1913). <See also my addition to note 359, below. C. K.>

²⁹⁰*Epistulae* 2.1.134-138.

²⁹¹The wording of verses 3-4 recalls the wording of a prayer recorded by Cato, *De Agri Cultura* 141.1-3.

²⁹²*Naturales Quaestiones* 4.7.3.

^{292a}After I had completed this paper, I found that Professor Morgan's article is criticized severely by O. Gruppe, *Bericht über die Literatur zur Antiken Mythologie und Religionsgeschichte aus den Jahren 1898-1905*, 336-377, Supplementband of *Jahresbericht über die Fortschritte der Klassischen Altertumswissenschaft*, 137 (1908). He says, among other things, that Professor Morgan had too little material and that the starting-point of his investigation was not well chosen. He makes the following general criticism: "Es ist eine irrigte Voraussetzung, dass die Chronologie einer Entwicklung sich aus der Chronologie der Zeugnisse ergebe".

²⁹³5.1226-1232.

²⁹⁴I cited in C. W. 18.157 B, 25.216 C-D, 27.28 B-C many expressions of disbelief in popular ideas about the weather. I shall add a number of others in another connection in a future paper. They are not confined to any one period.

²⁹⁵Ovid, *Remedia Amoris* 214-219.

²⁹⁶Aristophanes, *Nubes* 367-368.

²⁹⁷36.17.2-4.

²⁹⁸1.104.

hand of Zeus. It may have done so, but, if it did, it did so only in the case of the educated few. It is conceivable, however, that there may have been less hocus-pocus in regard to the weather during the best days of Greece and Rome.

I was entirely unconvinced when I read the following words in a periodical in 1924²⁹⁹:

...If you teach the public in the newspaper every week-day that the weather is fixed through complicated laws, that if the barometer is rising fair weather is probable, while rain may be expected if it is falling, you cannot expect them to believe on Sunday that the humidity of the atmosphere will be affected by prayer.

The clippings which I have quoted are enough to prove that prayer is still widely resorted to in times of drought. The terrible drought of the summer of 1930 inspired one Christian periodical to ask a number of prominent theologians whether prayer changes the weather³⁰⁰.

SACRIFICE AS A REMEDY FOR DROUGHT

For drought, as for other afflictions, including calms and unfavorable winds³⁰¹, sacrifice was the great panacea³⁰².

When Numa was king, the harvest did not answer to the labour bestowed on it; the husbandman was deceived, and his prayers were offered in vain. For at one time the year was dry, the north winds blowing cold; at another time the fields were rank with ceaseless rain; often at the first sprouting the crop balked its owner, and the light oats overran the choked soil, and the cattle dropped their unripe young before the time, and often the ewe perished in giving birth to her lamb. There was an ancient wood, long unprofaned by the axe, left sacred to the god of Maenalus. He to the quiet mind gave answers in the silence of the night. Here Numa sacrificed two ewes. The first fell in honour of Faunus, the second fell in honour of gentle Sleep: the fleeces of both were spread on the hard ground. Twice the king's unshorn head was sprinkled with water from a spring; twice he veiled his brows with beechen leaves. He refrained from the pleasures of love³⁰³; no flesh might be served up to him at table; he might wear no ring on his fingers. Covered with a rough garment he laid him down on the fresh fleeces after worshipping the god in the appropriate words. Meantime, her calm brow wreathed with poppies, Night drew on, and in her train brought darkling dreams. Faunus was come, and setting his hard hoof on the sheep's fleeces uttered these words on the right side of the bed: "O King, thou must appease Earth by the death of two cows: let one heifer yield two lives in sacrifice." Fear banished sleep: Numa pondered the vision, and revolved in his mind the dark sayings and mysterious commands. His wife, the darling of the grove, extricated him from his doubts and said, "What is demanded of thee are the inwards of a pregnant cow." The inwards of a pregnant cow were offered; the year proved more fruitful, and earth and cattle yielded their increase.

It seems, says Origen³⁰⁴, that death willingly suffered by a just man will ward off the demons which cause bad weather. One thinks of the case of Molpis³⁰⁵, who, after a long period of rainless weather in Elis, offered himself as a victim to Zeus Ombrios (Iuppiter Pluvius), whereupon

rain at once descended. In gratitude his countrymen built a temple in honor of the god and set up in it a statue of their benefactor³⁰⁶.

There are other examples of self-sacrifice in behalf of a people suffering from drought. When the land of Thebes was parched and the trees were bare of leaves, an oracle of the Gortynian Apollo declared that the country could be delivered only by the voluntary sacrifice of two virgins. On learning of this two girls willingly took their own lives^{306a}.

The frequency of such legends, among which the traditional sacrifice of Iphigenia at Aulis may be included, suggests that formerly the Greeks used actually to sacrifice maidens in great emergencies, such as plagues and prolonged droughts, when ordinary sacrifices had proved ineffectual^{306b}.

Like other nations, the Greeks found substitutes for human sacrifice as their civilization became more refined. During a dearth of crops among the Chalcidians one man out of every ten was dedicated to Apollo, but these intended victims were allowed to emigrate, along with some other citizens, with whom they founded the town of Rhegium³⁰⁷.

It is worth noting that Hera was associated with Zeus in sacrifices made upon Mount Arachnaeon, above Lessa, in an effort to relieve drought³⁰⁸.

During excessive heat and drought the Athenians offered to the Seasons boiled rather than roasted meat. By this means they secured for their crops moderate warmth and seasonable rains³⁰⁹. The underlying conception was that the water in the pot was transmitted through the boiled meat to the deities³¹⁰, but in primitive reasoning rain has been attributed to a boiling process and among primitive peoples boiling is imitated by magical rites³¹¹. A good example of such rain-making is to be found in a collection of Negro stories from our own land:

"De cunjah man lafft en lafft, en he put on his bigges' pot, en fill it wid his stronges' roots, en b'iled it, 'tel bimeby de win' blowed en blowed tel it blowed down de live-oak tree. Den he stirred some more roots in de pot, en it rained en rained 'tel de water run down de ribber bank en wash Dan's life cha'm inter de ribber. . .'"³¹²

When there happened to be an unusually severe drought in Egypt, with attendant diseases and other evils, the priests, amid great stillness, would conduct into a dark place some of the animals they honored. If terrifying the beasts did not relieve conditions, the priests consecrated the animals and offered them up as victims. Plutarch³¹³, who evidently did not thoroughly understand the ceremony, looked upon it as a method of punishing the evil god, or at least as some form of emergency purgation.

There is extant an inscription that was set up on the Island of Cos in the third century before Christ by a religious association in honor of officials who conducted sacrifices in order to influence 'Rainy Zeus'³¹⁴.

²⁹⁹The Atlantic Monthly 134 (1924), 164.

³⁰⁰Does Prayer Change the Weather?, The Christian Century 47 (1930), 1084-1086.

³⁰¹See C. W. 27.2-3 A, 10 B-C.

³⁰²Ovid, Fasti 4.641-672, I give the translation by Sir James G. Frazer, in The Loeb Classical Library.

³⁰³See note 262, above.

³⁰⁴Contra Celsum 1.31 (Migne, P. G., 11.717, 719).

³⁰⁵Lycophron, Alexandra 159-160.

³⁰⁶Tzetzes on Lycophron as cited in note 305, above.

^{306a}Ovid, Metamorphoses 15.685-689; Antoninus Liberalis 25.

^{306b}Sir James G. Frazer, Apollodorus 2.119 (see note 233, above).

³⁰⁷Strabo 6.1.6.

³⁰⁸Pausanias 2.25.10.

³⁰⁹Athenaeus 656 A.

³¹⁰Frazer, The Magic Art, 1.310.

³¹¹Hamilton, 218 (see note 153, above).

³¹²Charles W. Chesnutt, The Conjure Woman, 176 (Boston, Houghton Mifflin and Co., 1899).

³¹³Moralia 380 C-D.

³¹⁴Charles Michel, Recueil d'Inscriptions Grecques, No. 1004 (Brussels, H. Lamertin, 1900).

Miss Harrison³¹⁵ thinks that the statement of Pausanias³¹⁶ that 'When Erechtheus was king of the Athenians, the Ox-Slayer slew an ox for the first time on the altar of Zeus Polieus' has not received sufficient attention. After a discussion of the meaning of this remark by Pausanias she concludes³¹⁷ that "...The Bouphonia was an appeal to the sterner powers of the sky, to thunder, and lightning, and the rain-storm".

PROCESSIONS

Among the impressive religious ceremonies of antiquity were processions, which were generally held amid great calamities, but one of the most formal of them, the Suovetaurilia, was intended to secure immunity from disasters and from malevolent powers. During it Father Mars was invoked to protect the farm and its owners and animals in many ways, among them by keeping away blighting and destructive weather³¹⁸.

In times of drought in Italy matrons might wend their way through the streets of a town to a temple and invoke Jupiter for rain. That there might be no restricting or hampering influence they first removed their sandals and unbound their hair. From this ceremony people returned *udi tanquam mures*³¹⁹.

The success of the services that is implied by the last three words has been surpassed within recent years in our own country. Part of a clipping from The Detroit Free Press, July 17, 1923, reads as follows:

Some of the farmers were dubious about praying for rain as 15 years ago when they prayed for rain they got a cloudburst which washed out many crops.

The ceremony of the matrons was doubtless different from the one called *nudipedalia*, which is thus described by Tertullian³²⁰: "...cotidie pasti statimque pransuri, balneis et cauponis et lupanaribus operantibus, aquilicia Iovi immolatis, nudipedalia populo denuntiatis, caelum apud Capitolium quaeritis, nubila de laquearibus expectatis, aversi ab ipso et deo et caelo. . . . In another passage³²¹ Tertullian reveals admiration for the conduct of pagans when heaven is benumbed (*stupet*) and there is parching weather. At such times the magistrates laid aside their 'purple' robes, reversed their *fascies*, raised their voices in prayer, and offered a victim. It is doubtful whether this ceremony ever took place in Rome itself³²².

At Gaza a procession was turned to Christian use. When the pagans, who had attributed a long drought to the arrival of Saint Porphyrius, flocked to the shrine of Marnas, 'master of the rains', but failed to secure relief, the Christians resorted to prayers, genuflections, and a procession with a cross. When this means was effective, the pagans cried, 'Christ is the only god. He alone has conquered'³²³.

In the Vita S. Pauli Junioris (he died in 956 A.D.) there is described a procession up Mount Latmos when

a drought was harassing Miletus³²⁴. On the top of the mount was a large stone which had long been regarded as sacred. Up the difficult ascent to it a procession of not fewer than forty persons wended its way singing sacred hymns. There is a touch of unconscious humor in a second, more definite, reference to the number of participants as 'forty, without counting boys and women'³²⁵. We are not told whether or not this special mission was successful.

Processions continue to be an effective means of securing rainfall in classical countries. Of one on the Island of Tinos an American writer says³²⁶:

Another story I was able to confirm as founded on truth. There had been a long drought, and the icon was carried to the top of a hill, where prayers were held, with the result that the floodgates of heaven were opened and the rain fell in torrents; surely, enough to confirm belief.

Still more instructive are the words of a native Italian in regard to such ceremonies³²⁷:

This superstition of country-people is still common, in an almost unchanged form, in Sicily. In my town, a few miles from Palermo, nearly every year, in spring and in autumn, the farmers have recourse to a saint, the Madonna delle Grazie, hoping thus to obtain rain for their parched fields. On such occasions, men and women, the most devout, barefooted, go in procession, with a priest at their head, praying for rain all along the way, to the Church of the Madonna, which is situated in the country-side, about half a mile from the town; they carry the image of the saint to the town and processionally go about through the streets, sincerely believing that the Madonna will hearken to their prayers and send the needed rain. Old people say that often rain has fallen while they were carrying the saint in procession. . . .³²⁸

Similar services have taken place in our own country. The following account³²⁹ has its setting in Santa Fe, an old seat of the Franciscans:

A few years ago when the rain had not wet the earth for weeks and weeks, a religious procession was held as a special plea for relief: a pilgrimage of the multitude from the church to a holy shrine on the outskirts of the village. The throngs marched in the heat along the dust of the road to the chapel and back—but no rain came. The faithful stoically traversed the heated Holy Way a second time—and no rain came.

The few men who carried the sacred throne dashed from the churchyard with angry shouts before any one could prevent them, kidnapping the Virgin! Her golden tinsel was strewn on the street. Her holy image was hurled into the sandy river-bed by the faithless cowards.

And Heaven was so agitated over the blasphemous affair that it gathered its clouds, hurled its thunderbolts, and poured its rain down in torrents, bringing to an end one of the longest and most terrible droughts that had ever been known.

³²⁴Analecta Bollandiana 11 (1892), page 53 (§ 18).

³²⁵*Ibidem*, page 55 (§ 19).

³²⁶G. Horton, *Home of Nymphs and Vampires*, 183 (The Bobbs-Merrill Co., Indianapolis, 1929).

³²⁷Anthony Rini, *Popular Superstitions in Petronius and Italian Superstitions of To-day*, C. W. 22.86.

³²⁸In Charles Read, *The Cloister and the Hearth*, Chapter 55, there is described the Venetian custom of carrying a picture of the Virgin in procession in order to bring rain.

³²⁹The Outlook 138 (1924), 384. The Outlook quotes this from a periodical of Santa Fe with the curious title "laughing horse" <the title is made worse by the absurdity of printing the title throughout in small letters. C. K.>. I should not think of using such a source in a subject other than folklore. The quotation contains nothing, however, which does not have the earmarks of verisimilitude.

With the last paragraph one may compare a statement in Frazer, *The Magic Art*, 1.300: "At Palermo they dumped St. Joseph in a garden to see the state of things for himself, and they swore to leave him there in the sun till rain fell".

³¹⁵Jane Ellen Harrison, *Themis*, 169 (Cambridge: At the University Press, 1927).

³¹⁶1.28.10. ³¹⁷174 (see not 315, above).

³¹⁸Cato, *De Agri Cultura* 141.1-3.

³¹⁹Petronius 44. There is no clear proof that such a procession was ever held in Rome. See Morgan, 100-101.

³²⁰Apologeticus 40.14.

³²¹See Morgan, 101-103.

³²²De Ieiuniis 16.

³²³Marcus Diaconus, *Life of Porphyrius* 19-21. For a fuller version of this story and for other references to drought see THE CLASSICAL WEEKLY 18.165 A-B.

Processions to invoke rain are remote from the thoughts and experiences of most of us, but they seem more real when we find a passage about such a procession in the biography of a prominent American professor and inventor^{329a}:

...The location of the original church <of Idvor> was marked by a little column built of bricks and bearing a cross. In a recess on the side of the column was the image of St. Mary with the Christ Child, illuminated by a burning wick immersed in oil. The legend was that this flame was never allowed to go out, and that a religious procession by the good people of Idvor to the old monument was sure to avert any calamity, like pestilence or drought, that might be threatening the village. I took part in many of these processions to the old deserted village. . . .

MAGIC AND DROUGHT

Since drought did so much injury and since many of its effects lasted long after rain had fallen, it is not strange that magic was resorted to in an effort to cause nourishing rains.

Some stones possessed the magical power of bringing rain to end drought³³⁰. If one takes smooth, green jasper and offers sacrifice to the gods, their hearts are warmed and they 'sate' the drought-ridden fields with clouds, and cause abundant rain³³¹. Coral crushed and sown with Demeter's seed will drive off the hot weather that drinks the milk of the grain³³².

Another magical stone was the *lapis manalis*, which was kept outside the Porta Capena of Rome near the Temple of Mars. The manner in which it was used will be described later³³³.

A Greek traveler in India is said to have seen two jars of black stone, one of which contained rains, the other winds. When India was suffering from drought, the jar containing rains was opened³³⁴.

On one occasion Attica was freed from a drought after the magical *inyx* was moved³³⁵. The device was evidently a wheel upon which the bird was fastened.

The most famous stone mentioned in connection with drought is the *lapis manalis*, which was kept 'outside the Porta Capena near the Temple of Mars'³³⁶. It is said that the pontifices drew it through the city as often as there was a dry spell³³⁷ and that rain followed forthwith (*insequebatur pluvia statim*)³³⁸.

We are told of this stone that, quod aquas manaret, manalem lapidem dixere³³⁹. Something about it suggested to Varro³⁴⁰ an *urceolus*, and he adds, unde manalis lapis appellatur in pontificalibus sacris, qui tunc movetur cum pluviae exoptantur. Evidently the stone was hollow and water trickled or was shaken from it as it was carried³⁴¹.

^{329a}Michael Pupin, From Immigrant to Inventor, 4 (New York, Scribner's, 1922). Professor Pupin considered himself a Serbian. At present Idvor is within the limits of Yugoslavia.

³³⁰See C. W. 18.163 D.

³³¹Orphei Lithica 267-270 (see note 41, above).

³³²*Ibidem*, 594-596.

³³³See the text connected with note 341, below.

³³⁴Philostratus, Vita Apollonii 3.14.

³³⁵Marinus, Proclus 28. Compare Theocritus 2.17.

³³⁶Festus 115 (W. M. Lindsay's edition [Leipzig, Teubner, 1913]).

³³⁷Daniel-Servius on Vergil, Aeneid 3.175. Compare Festus 2.

³³⁸Festus 115. ³³⁹*Ibidem*.

³⁴⁰As quoted by Nonius, under *trulleum*, 3.877 (W. M. Lindsay's edition [Leipzig, Teubner, 1903]).

³⁴¹For references to the literature see Morgan, 105. See also Frazer, The Magic Art, 1.310, note 3, and H. J. Rose, Primitive Culture in Italy, 57 (London, Methuen, 1926). Morgan notes (102)

A vase may have been used in a somewhat similar way in a rain-making ceremony at Crannon in Thessaly. On a seal of the city two crows are represented as perching on a bronze chariot. When a drought occurred, people shook the chariot and prayed for rain³⁴². Coins of Thessaly still extant show a large *amphora* resting on a chariot³⁴³. It has been conjectured that, when the chariot, was shaken and made a noise like thunder, water spilling from the vase imitated rain³⁴⁴. The ceremony was, then, an attempt to induce rain by sympathetic magic.

According to modern folklore, on the Island of Amorgos God himself shakes a bowl to produce rain. This we learn from the words of an English traveler³⁴⁵ in the Cyclades:

It was a wet morning, and the good priest would willingly have stopped at home had I not urged him to start. "God is emptying His bowl," my parishioners would say, and then he explained the prevalent idea that God, like Zeus of antiquity, has a bowl or receptacle full of water, which He shakes, and then clouds come out; these fall to the earth as rain or snow.

Examples of imitation of thunder and lightning³⁴⁶ and of falling rain³⁴⁷ are common enough in folklore. An amusing instance of causing rain by drenching was reported in The Chicago Daily Tribune, August 19, 1926:

Tokio, Aug. 18.—The secretary of the American embassy was motoring through the village of Hachioji, near Tokio, on Sunday and was suddenly drenched with water by a crowd before a wayside shrine. Believing an insult was intended, the secretary reported the incident to the foreign office. An investigation reveals <sic!> that the crowd was performing a ceremony including throwing water on the first passerby. Hachioji officials were much chagrined upon learning the identity of the person drenched and apologized.

FOUNTAINS AND STREAMS

One of the most interesting rain-bringing ceremonies was held on Mount Lycaeus in Arcadia³⁴⁸:

If there is a long drought, and the seeds in the earth and the trees are withering, the priest of Lycaean Zeus looks to the water and prays; and having prayed and offered the sacrifices enjoined by custom, he lets down an oak branch to the surface of the spring, but not deep into it; and the water being stirred, there rises a mist-like vapour, and in a little the vapour becomes a cloud, and gathering other clouds to itself it causes rain to fall on the land of Arcadia³⁴⁹.

that there is no evidence that this stone was ever carried in the ceremony called *nudipedalia* (see the text connected with note 320, above). In C. W. 25.205 A, 206 A I gave other references to the literature about this stone.

³⁴²Antigonos, Historia Mirabilia 15.

³⁴³Percy Gardner, A Catalogue of the Greek Coins in the British Museum, Thessaly to Aetolia, Plate 2, Figure 13 (London, Printed by Order of the Trustees, 1883).

³⁴⁴Adolf Furtwängler, Meisterwerke der Griechischen Plastik: Kunstgeschichtliche Untersuchungen, 259 (Leipzig and Berlin, Giesecke und Devrient, 1893). See also Frazer, The Magic Art, 1.309, note 6.

³⁴⁵Bent, 488 (see note 278, above).

³⁴⁶See C. W. 18.157 C.

³⁴⁷See Jacob Grimm, Teutonic Mythology, Translated, From the Fourth German edition, by J. S. Stallybrass, 3.1086-1087 (London, George Bell and Sons, 1883). On drenching persons or idols with water as a rain-charm see J. Rendel Harris, Notes from Armenia, in Illustration of *The Golden Bough*, Folk-Lore 15 [1904], 429-435; Sarat Chandra Mitra, A Rain Ceremony from the Murshidabad District of Bengal, Folk-Lore 9 (1898), 278.

³⁴⁸Pausanias 8.38.4. I give the translation by Sir James G. Frazer, Pausanias's Description of Greece, 1.423 (London, Macmillan, 1898).

³⁴⁹For references to the critical literature which has grown up about this passage see Hamilton, 356 (see note 153, above).

Perhaps other ceremonies were held about small bodies of water during dry periods. An American scholar³⁵⁰ has made the following cautious statement:

... It appears to me very probable that in times of drought both Greeks and Romans were in the habit of praying to the divinities of the well-springs, fountains, and sources of streams themselves, rather than to Zeus or Jupiter or any other god for rain,—that is, that they offered vows and prayers to the Nymphae or Lymphae and similar divinities. . . .³⁵¹

Miss Harrison³⁵² concludes that the water-bearing Danaides had once been well-nymphs whose duty it was to water and fertilize thirsty Argos.

On meeting Hypsipyle in a wood in time of drought Adrastus seems to pretend that she is a water nymph, and he addresses her accordingly for aid against the drought³⁵³:

Da fessis in rebus opem, seu turbidus amnis,
seu tibi foeda palus <est>; nihil hac in sorte pudendum,
nil humile est; tu nunc undis (Pluvioque rogaris
pro Iove), tu refugas viris et pectora bellis
exanimata reple. . . .

In Italy nymphs of springs and other water-deities were appealed to for relief from drought. Varro³⁵⁴ prayed to Lympha and Bonus Eventus because without water (evidently rain) all agriculture is barren and without happy issue. Daniel-Servius³⁵⁵ tells us that sacrifices were made to the fountain of Iuturna when rain failed (*propter aquarum inopiam*).

There seems to be enough evidence³⁵⁶ to show that . . . Iuturna and the nymphs were worshipped by the Romans as water-deities from about the middle of the third century B.C. to at least the end of the first century B.C. . . .

Doubtless modern Greek rain-bringing ceremonies at wells and springs have a long history behind them:

In Thessaly and Macedonia it is customary in times of prolonged drought to send a procession of children round to all the wells and springs of the neighbourhood. At their head walks a girl adorned with flowers, whom they drench with water at each halting-place while singing this invocation³⁵⁷:

³⁵⁰Morgan, 108.

³⁵¹See Floyd G. Ballentine, *Some Phases of the Cult of the Nymphs*, Harvard Studies in Classical Philology 15 (1904), 77-78.

³⁵²Jane E. Harrison, *Prolegomena to the Study of Greek Religion*, 620 (Cambridge: At the University Press, 1903).

³⁵³Statius, *Thebais* 4.757-761. I give the reading of the edition by H. W. Garrod (Oxford: At the Clarendon Press, 1906). On this passage see Morgan, 99. <Professor Morgan has nothing to say about the text or the punctuation of this passage. He prints only *Da fessis*. . . *pro Iove*, presenting the last part thus: "nil humile est: 'tu nunc ventis pluvioque rogaris pro Iove' ". I confess that I cannot interpret Professor Garrod's text. In a note to his text he says, "undis ego (ventis *codd.*) et interpunctionem mutavi, cf. *Class. Rev.* xviii.1". Neither on page 1 nor in Number 1 of *The Classical Review* 18 does Mr. Garrod speak of this passage. In *The Classical Review* 18.300 he devotes six lines to the passage, saying "... Perhaps tu nunc undis—pluvioque rogaris pro Iove—tu refugas etc." There is no help in such a note to interpretation of the passage as a whole. In the Loeb Classical Library version of Statius, 1.564 (1928), Mr. J. H. Mozley prints nil humile est; tu nunc Ventis pluvioque rogaris pro Iove, tu refugas vires. . . reple. The manuscripts give *ventis*; *undis* is an emendation by Mr. Garrod (see the preceding paragraph. This is a very attractive emendation, I admit, but it is an arbitrary emendation). I should myself set a parenthesis mark before *nihil* and another after *Iove*. I take *pro* in 758 with *ventis* (*undis*) as well as with *Iove*, and render by 'to you now in place of the winds and Zeus, god of the rains, appeal is made'. The words I set in the parenthesis constitute an effective pause in the midst of the prayer, begun at *Da*, 757. They give the ground for the whole appeal. In a word, *tu*. . . *Iove* = *tu enim*. . . *rogaris*, or *namque tu*. . . *rogaris*. . . C. K.>.

³⁵⁴Varro, *Res Rusticae* 1.1.6. See also St. Augustine, *De Civitate Dei* 4.22, 34, 6.1. ³⁵⁵On Vergil, *Aeneid* 12.139.

³⁵⁶Floyd G. Ballentine, 93 (see note 351, above). See also 90-97.

³⁵⁷Lucy M. J. Garnett, *The Women of Turkey and Their Folk-*

Perperia, all fresh bedewed,
Freshen all the neighbourhood;
By the woods, on the highway,
As thou goest, to God now pray:
O my God, upon the plain,
Send thou us a still, small rain;
That the fields may fruitful be,
And vines in blossom we may see;
That the grain be full and sound,
And wealthy grow the folks around;
Wheat and barley,
Ripen early,
Maize and cotton may take root,
Rice and rye and currants shoot;
Gladness in our gardens all,
For the drought may fresh dews fall;
Water, water, by the pail,
Grain in heaps beneath the flail;
Bushels grow from every ear,
Each vine-stem a burden bear.
Out with drought and poverty
Dew and blessings may we see!

THE NILE AS A SUBSTITUTE FOR RAINY ZEUS

In Egypt drought was caused by the failure of the waters of the Nile to cover the land. Herodotus³⁵⁸ calls attention to the lack of rainfall in the upper parts of Egypt. The remarks of Seneca³⁵⁹ in regard to the rôle of the great Egyptian river are exceedingly interesting:

Hunc nobilissimum amnium natura extulit ante humani generis oculos et ita disposuit ut eo tempore inundaret Aegyptum quo maxime usta fervoribus terra undas altius traheret tantum usura^{359a} quantum siccitati annuae sufficere possit. Nam in ea parte quae in Aethiopiam vergit aut nulli imbres sunt aut rari et qui insuetam aquis caelestibus terram non adjuvent. Unam, ut scis, Aegyptus in hoc spem suam habet: proinde aut sterilis annus aut fertilis est, prout ille magnus influxit aut parciat. 'Nemo aratorum respicit caelum': quare non cum poeta meo iocor, et illi Ovidium suum impingo, qui ait nec Pluvio supplicat herba Iovi?

Egyptians of the time of Herodotus were dumb-founded on learning for the first time that Greece, unlike their own land, was not irrigated and was at the mercy of the divine will for a supply of water. They thought that, if Jupiter should some time withhold rain, the population would perish^{359b}.

The Nile swept over its banks when the sun was in the constellation of Leo. For this reason sculptured representations of lions' heads were used as spouts for fountains in Egypt³⁶⁰. The custom spread to Greece and Italy, and ultimately to us³⁶¹.

Lore, *The Christian Women*, 123-124 (London, David Nutt, 1890). Compare B. Schmidt, *Das Volksleben der Neugriechen und das Hellenische Alterthum*, 30 (Leipzig, Teubner, 1871).

³⁵⁸3.10. ³⁵⁹Naturales Quaestiones 4.2.1-2. <The words *Nemo*. . . *caelum* evidently occurred in a poem by Lucilius, the friend to whom Seneca dedicates the *Quaestiones Naturales*. The words that Seneca ascribes to Ovid are part of Tibullus 1.7.26. Professor K. F. Smith, in his note on this passage, states that *Iuppiter Pluvius* is the only Tibullan expression to be found in the ordinary speech of modern times. C. K.>.

<359a *usura* is the reading in the Teubner text of A. Gercke (1907). In the Teubner text by Friedrich Haase (1913) the reading is *hausura* (with *ha* in Italics). C. K.>.

^{359b}Herodotus 2.13.14. See also 2.22, 25. Tibullus notes (1.7.26) that, because of the Nile, Egypt did not have to pray to Zeus for rain. See also Euripides, *Helena* 1-3; Apollonius Rhodius 4.270-271; Cicero, *De Natura Deorum* 2.130; Lucan 8.147, 444-447; Valerius Flaccus 5.423; Ammianus Marcellinus 22.15.6; Carminum Minorum Corpusculum 28 (47). For a wonderful ancient hymn extolling the Nile as the giver of life and the bringer of food see A. E. Wallace Budge, *The Dwellers on the Nile*, 105 (London, The Religious Tract Society, 1926).

³⁶⁰Plutarch, *Moralia* 670 C.

³⁶¹The Works of Sir Thomas Browne, Edited by Geoffrey Keynes, 3.145-146 (London, Faber and Gwyer, 1928).

For countries other than Egypt Zeus, according to Isocrates³⁶², was the lord of rains and droughts. Busiris himself had ample reason to feel contented when he saw some lands flooded after excessive rains and some parched from too much heat³⁶³.

THE LEGEND OF CLAUDIA QUINTA

A drought provided the setting for one of the most curious legends of Rome³⁶⁴. After the ship which had been sent to bring the Mother of the Gods from Mount Ida to Rome had escaped the perils of the open sea, it grounded at the mouth of the Tiber.

The men wearied their arms by tugging lustily at the rope; hardly did the foreign ship make head against the stream. A drought had long prevailed; the grass was parched and burnt; the loaded bark sank in the muddy shallows. Every man who lent a hand toiled beyond his strength and cheered on the workers by his cries. Yet the ship stuck fast, like an island firmly fixed in the middle of the sea³⁶⁵.

It was in this emergency that Claudia Quinta appeared, eager to retrieve a reputation which had suffered from gossip. Her failure to start the ship was to be adjudged a sign of guilt, her success a proof of innocence. The goddess yielded to her prayer, and the ship followed the maid as she gently drew the rope.

ANGER AND HOSTILITY MANIFESTED TOWARD HEAT AND DROUGHT

In previous papers I gave several examples of fighting the elements³⁶⁶. Demonstrations of hostility were made against hot weather also, and against its chief cause, the sun.

As we have seen, farmers abused 'those responsible' whenever there was too much or too little rain for their crops³⁶⁷. The Atarantes reviled the sun in most shameful fashion when it parched both them and their country³⁶⁸. Strabo³⁶⁹ tells us that members of an Ethiopian tribe swore at the rising sun as being bent upon burning them and warring upon them. Heracles shot an arrow at the sun when it made him too hot³⁷⁰.

That mild dissatisfaction with the Greek deity was doubtless often expressed we may infer, if the garrulous man in the 'Characters' of Theophrastus³⁷¹ is representative. He insisted that, if Zeus would send more water, the crops would be better off. In the same work³⁷² the grumbler is provoked at Zeus not for not raining, but for having taken so long to send the rain.

If our records from antiquity were fuller, we could doubtless find a close parallel to the angry exhibition of displeasure shown by the hero of a recent novel toward the 'Old Man in Heaven', who had ruined crops by a long, severe drought³⁷³:

Wang Lung, sitting at the threshold of his door, said to himself that now surely something must be done.

³⁶²Busiris 6.13. ³⁶³Isocrates, Busiris 6.12-13.

³⁶⁴Ovid, Fasti 4.247-348.

³⁶⁵*Ibidem*, 4.297-303. I give Sir James G. Frazer's translation, in The Loeb Classical Library.

³⁶⁶C. W. 18.165 D-166 A, 27.20 D, and the text connected with notes 114-121, above. ³⁶⁷See note 194, above.

³⁶⁸Herodotus 4.184. See A Dictionary of Greek and Roman Geography, Edited by William Smith, under Atarantes, 1.252 (London, John Murray, 1878); Fiedler, 37.

³⁶⁹17.2.3.

³⁷⁰Apollodorus, Bibliotheca 2.5.10 (see note 233, above).

³⁷¹13 (18). ³⁷²17 (22). Compare 3 (18).

³⁷³Pearl S. Buck, The Good Earth, 79 (see note 271, above).

They could not remain here in this empty house and die. . . There was such anger in him now as he often could not express. At times it seized him like a frenzy so that he rushed out upon his barren threshing floor and shook his arms at the foolish sky that shone above him, eternally blue and clear and cold and cloudless.

"Oh, you are too wicked, you Old Man in Heaven!" he would cry recklessly. And if for an instant he were afraid, he would the next instant cry sullenly, "And what can happen to me worse than that which has happened!"

DROUGHTS WHICH AFFECTED INTERNATIONAL RELATIONS

We have seen that an incident at a rain-making ceremony in Japan caused some official embarrassment³⁷⁴, and we have noted that some aspects of the story of Busiris became distasteful both to Greeks and to Egyptians³⁷⁵. There was one drought which aroused serious international complications³⁷⁶. When the land of the Epidaurians was suffering from a period of scarcity, the oracle at Delphi advised them to make statues of olive wood in honor of Auxesia and Damia, two Cretan maidens to whom, as Pausanias tells us³⁷⁷, the Troezenians gave divine honors after they had been stoned to death during an insurrection. It seems that only the Athenians had olive trees at this time. In order to secure one of them the Epidaurians had to agree to offer annual sacrifices to Athena Polias and Eretheus. When the statues had been made, the land of the Epidaurians again became productive.

Trouble was caused, however, when Aegina revolted from the Epidaurians and took away the statues. The Athenians demanded their surrender, and, on being refused, sent an expedition to secure them by force. As the invaders were trying to drag away the statues by the aid of ropes, thunder and an earthquake occurred. The invaders were seized with madness and began to kill one another, so that only one man survived.

ANCIENT RECOGNITION OF THE WORTHLESSNESS OF POPULAR IDEAS ABOUT DROUGHT

I have given elsewhere examples of ancient recognition that many popular beliefs about the weather are worthless and that the actions of the elements are to be ascribed to natural causes³⁷⁸. Similar statements about drought are more difficult to find. In De Morbo Sacro³⁷⁹, which is found with the works of Hippocrates, persons who profess to know how to induce storms and fine weather and rains and droughts are accused of being impious, and of assuming that there are no gods, or, if there are, that they cannot ward off the greatest evils.

More than a millennium later, Agobard³⁸⁰, whose *floruit* was in the ninth century, manifested even more impatience with weather quacks and challenged farmers to produce *tempestarii* to give evidence of their powers. He himself ascribed the control of the weather to the Christian deity.

In striking contrast with the Christian outlook is that

³⁷⁴See the quotation below the reference for note 347, above.

³⁷⁵See the text connected with notes 242-244, above.

³⁷⁶The account in the text above is the Athenian version of the story as given by Herodotus 5.82-85. For the Aeginetan version see Herodotus 5.87-88. See also Pausanias 2.30.4.

³⁷⁷2.32.2. ³⁷⁸C. W. 18.157 B, 25.216 B-C, 27.28 B-C.

³⁷⁹Chapter 1.

³⁸⁰De Grandine et Tonitruis 13 (Migne, P. L., 104.155).

of Sophocles³⁸¹, who asserts that Zeus causes neither excessive rainfall nor severe droughts. Greek popular thought was as saturated with the idea of divine control of the weather as was that of the Jews of the Old Testament, but Sophocles and a few other Greeks managed to free themselves from the shackles of such thought.

In the sixth century the idea that the devil caused drought and bad weather was not infrequent among Christian teachers, so that, as we have seen³⁸², the synod at Braga had to take measures to try to eradicate it.

In the Georgics³⁸³ Vergil, the poet of farmers and farming, has much to say about the weather. He was aware of the great losses husbandmen and vineyardists suffered from hail and drought, but still he felt that they were happy in their lot:

O fortunatos nimium, sua si bona norint,
agricolas, quibus ipsa, procul discordibus armis,
fundit humo facilem victum iustissima tellus!

UNIVERSITY OF MICHIGAN

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ON BUYING A FARM

In his *De Agri Cultura* 1.1-4¹ Cato discusses the buying of a farm:

Praedium quom parare cogitabis, sic in animo habeto uti ne cupide emas neve opera tua parcas visere et ne satis habeas semel circumire. Quotiens ibis, totiens magis placebit quod bonum erit. Vicini quo pacto nitent, id animum advertito; in bona regione bene nitere oportebit. Et uti eo introeas et circumspicias, uti inde exire possis. Uti bonum caelum habeat, ne calamitosum siet, solo bono, sua virtute valeat. Si poteris, sub radice montis siet, in meridiem spectet, loco salubri. Operariorum copia siet, bonumque aquarium. Oppidum validum prope siet aut mare aut amnis qua naves ambulant, aut via bona celebrisque. Siet in his agris qui non saepe dominos mutant; qui in his agris praedia vendiderint, eos pigeat vendidisse. Uti bene aedificatum siet. Caveto alienam disciplinam temere contemnas. De domino bono bonoque aedificatore melius emetur. . . .

Mr. Fairfax Harrison² translates this as follows:

When you have decided to purchase a farm, be careful not to buy rashly; do not spare your visits and be not content with a single tour of inspection. The more you go, the more will the place please you, if it be worth your attention. Give heed to the appearance of the neighbourhood,—a flourishing country should show its prosperity. "When you go in, look about, so that, when needs be, you can find your way out."

Take care that you choose a good climate, not subject to destructive storms, and a soil that is naturally strong. If possible, your farm should be at the foot of a mountain, looking to the South, in a healthy situation, where labour and cattle can be had, well watered, near a good sized town, and either on the sea or a navigable river, or else on a good and much frequented road. Choose a place which has not often changed ownership, one which is sold unwillingly, that has buildings in good repair.

Beware that you do not rashly condemn the experience of others. It is better to buy from a man who has farmed successfully and built well.

³⁸¹Fragment 524 (for the edition used see note 191, above).

³⁸²See the text connected with notes 161, 251, above.

³⁸³2.458-460.

¹For the text of Cato, *De Agri Cultura* see the edition by George Goetz (Leipzig, Teubner, 1922). This was a revision of an earlier edition, by Heinrich Keil.

²Roman Farm Management, *The Treatises of Cato and Varro Done into English, With Notes of Modern Instances*, By a Virginia Farmer (New York, Macmillan, 1922). The "Virginia Farmer" was Mr. Fairfax Harrison, President of the Southern Railway. <See page 23, notes 2, 3. C. K.>.

Similar advice regarding the purchase of a farm is to be found in a bulletin entitled *Selecting a farm*, by E. H. Thomson, which is published by the United States Department of Agriculture, as *Farmer's Bulletin* No. 1088.

I quote from this Bulletin the following statements (the figures in round brackets refer to pages):

(3) The wise selection of a farm is vital to the success and satisfaction of farm life. . . . ; (5) To achieve success in an ordinary farming venture it is almost essential to have these advantages: . . . Suitable conditions, both as to natural resources and environment and as to markets, to permit the development of a dependable organization of diversified activities. . . . ; (7) . . . Make doubly sure that climatic conditions, such as rainfall, period of drought, late spring or early fall frosts, hailstorms, strong winds, hot winds, fogs, and humidity do not seriously limit the development of a diversified farm business. . . . ; (12) The physical condition of the soil is an important matter and one which should receive first attention. . . . ; (13) The experienced farmer in selecting a farm will generally look first at the source and dependability of the water supply, because he knows that a farm without an adequate supply of water is most undesirable. . . . ; (14) . . . The character of the people in the neighborhood, their interests and ideals are also important. Very often an excellent farm is sold cheap because the owner does not care to live in a certain neighborhood. Disagreeable social features are not always apparent to the purchaser until some time after locating. Such conditions may not affect the productive possibilities of the farm, but do materially affect the home life and comfort of the farmer and his family and in that way make the farm undesirable; (15) Often it is a distinct advantage when purchasing a farm to buy the equipment, livestock, and materials already on the place. In this way an income is yielded almost from the outset, which usually makes possible the operation of the farm without a loss, and thus gives the newcomer a chance to work out changes and plans and at the same time have a self-sustaining farm business.

The advice of the government experts to-day does not differ fundamentally from the suggestions given by Cato two hundred years, more or less, before Christ to aid the prospective buyer of a farm to reach a right choice of property for purchase.

NATALIE HUNTER³

THE RISING OF COLD AGAIN

In *THE CLASSICAL WEEKLY* 26.99-100 Professor W. A. Oldfather, in a short note entitled *The Rising of Cold*, expressed the opinion that the idea of the rising of cold was "a bit of Greek folklore", and in support of this suggestion cited two passages from Aristotle¹. He then said:

What is the origin of the erroneous notion? One might conjecture that it was based, at least in part, upon the relative coolness of cellars and caves, of spring-waters and well-waters, and the undoubted fact that, once the ground has been frozen to any depth, one needs, in lying upon it, to be protected by bedding more against the chill from below than against that from above. This is particularly noticeable in such countries as Alaska. . . .

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¹Professor Oldfather's quotations are as follows: Aristotle *Problemata* 23.34 (934 b, 21-23) ἡ ἐκ τῆς γῆς, ὥσπερ λέγεται, τὰ ψύχη ἀρχεται καὶ λανθάνει εἰσδύόμενα; and *Problemata* 934 b, 25-26) ἐν δὲ ταῖς τοιαύταις χώρας τὰ ψύχη κάτωθεν γίνεται.